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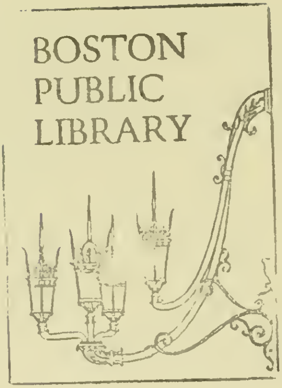

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DOWNTOWN BOSTON PARKING PROGRAMS

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PREPARED BY
THE BOSTON REDEVELOPMENT AUTHORITY
FOR
THE TRAFFIC & PARKING DEPARTMENT
CITY OF BOSTON
KEVIN H. WHITE, MAYOR
SPONSORED BY
THE METROPOLITAN AREA PLANNING COUNCIL
JULY, 1981

DOWNTOWN BOSTON PARKING PROGRAMS

Ellen Collins

Boston Redevelopment Authority
Transportation Planning Department

July, 1981

For

The Traffic & Parking Department
City of Boston

Kevin H. White, Mayor

Sponsored by

The Metropolitan Area Planning Council

FORWARD

The report on Downtown Boston Parking Programs is the third in a series of three reports prepared by the City of Boston, made possible by a grant from the U.S. Environmental Protection Agency (EPA). Section 175 of the 1977 Clean Air Act Amendment provides funds through the Metropolitan Area Planning Council, via the Urban Mass Transportation Administration to study ways of improving air quality within the Boston Region, and ultimately contribute toward the attainment of the national ambient air quality standards.

Acknowledgment is made to the invaluable assistance of the following individuals in the preparation of this report:

Eugenie Beal, Boston Air Pollution Control Commission
Geoffrey M. Boehm, Boston Air Pollution Control Commission
Philip J. Caruso, Boston Traffic & Parking Department
Alfred R. Howard, Boston Redevelopment Authority
Alexander Taft, Mayor's Office

and to Dennis M. O'Brien, who did all of the report graphics and assisted in the data collection.

DOWNTOWN BOSTON PARKING PROGRAMS

SUMMARY

This report presents a description of parking and travel in Downtown Boston and examines their relationships with development and the environment. Special emphasis is placed on the study of the effects of a "Freeze" on the number of commercial spaces to the total available in 1973 and on other parking management measures. The work represents a joint effort of the Boston Redevelopment Authority and City of Boston under the sponsorship of the Metropolitan Area Planning Council, using U.S. Environmental Protection Agency Section 175 funds.

A brief summary of the findings and major points of this report is outlined below:

Parking Freeze

The administration of the Freeze on commercial spaces in Boston Proper by the Air Pollution Control Commission (APCC) has been successful in limiting the number of these spaces to the Freeze ceiling level of 35,503. However, employee and other non-commercial parking spaces (not included in the Freeze) have increased by 18% since 1973 to a total of 20,260 spaces in 1980, resulting in an overall total of 55,500 spaces. This increase of 2,781 spaces since 1973 is estimated to be 7,500 spaces less than would have been built without the Freeze. In comparison, between 1968 and 1973, the total parking supply grew by 13,575 spaces (35%).

Criteria for parking facility design and operation are also contained in the Freeze. These standards, in conjunction with developmental factors, were responsible for the decrease in the number of open lots from 324 to 277, while the number of garages, predominately development-associated, rose from 72 in 1973 to 95 in 1980.

Development since the Freeze

During the time period the Freeze has been in operation, development has proceded, unimpeded by the Freeze. Over 8 million square feet of new and rehabilitated office space has been completed since 1973, and 5 million square feet is currently under construction. Employment in the Downtown has increased by approximately 9% since 1973 and retail sales have increased 3 to 4% between 1977 and 1979. Thus, Downtown development is proceeding at a healthy pace, and from all indications, the Freeze has not had a detrimental impact on development.

Travel Trends to Boston Proper

Of the more than 500,000 persons travelling to Boston Proper on a typical weekday, over one-third do so by transit (although two-thirds of peak period travellers are transit users), under 5% walk or bicycle, and the remainder arrive downtown via automobile. Since 1973, both automobile and transit trips to the core have slightly increased (less than 1% per year). This signifies a marked stabilization of the trend of increased auto usage, and a turnaround of the two-decade decline in public transit patronage. By comparison, automobile travel to Boston Proper increased 20% between 1964 and 1974, and transit ridership declined by 11%. Although factors such as the state of the economy, suburban development, Downtown congestion and the price of gasoline contributed to the stabilization of automobile usage, the Parking Freeze has had a definite influence in restraining automobile usage, and further encouraging the use of mass transit.

Air Quality Impacts

If the Parking Freeze had not been established, it is estimated that 8,000 more cars/day would be travelling to Boston Proper, an increase of 9% over current work trip vehicle miles travelled. This corresponds to a daily reduction of 12.00 metric tons of carbon monoxide and 0.96 metric tons of hydrocarbons, comprising 0.5% and .26% of regional levels of CO and HC, respectively. The implementation of all of the recommended measures in this report could result in an additional decrease in regional CO of up to 800,000 grams/day. For HC, up to 63,000 grams/day could be removed from the air in the Boston region.

Parking Conditions

As noted, the increase in parking spaces over the last several years has been, compared to earlier years, quite modest, and all of the growth has been in non-freeze spaces. Employee spaces account for two-thirds of the non-freeze parking supply, but they comprise only 43% of the non-commercial spaces constructed since 197 The majority of new spaces are reserved for residents and hotel gues

Parking fees overall have generally increased in accordance with the consumer price index, which is not what would be expected with a constraint on supply. However, there are indications that parking utilization has declined slightly over the past several years in the Downtown Crossing area. Since Downtown growth is evident, the decrease in parking utilization is not due to a decline in Downtown activity, but rather associated with higher fuel costs, somewhat greater transit usage and re-distribution of parking over a larger area.

Future of the Freeze

Various alternatives of the Freeze were considered, ranging from abolition to an inclusion of all non-residential spaces in the Freeze. It is recommended, however, that the Freeze in its present form be retained. This is due to the fact that it has been successful in stabilizing the number of commercial parking spaces in Boston Proper, thus curbing the growth of Downtown-oriented automobile travel with its attendant air pollution effects. At the same time, it has not had a negative effect on travel to or development in Downtown.

Due to possible changing economic and/or transportation conditions, it is further recommended that the Freeze be re-evaluated every three years.

Other Parking Controls

Since employee (non-freeze) spaces have increased since the Freeze, it is also recommended that more controls on employee spaces in Boston Proper be established. One recommended control is establishing a limit of 0.2 employee spaces per 1,000 square feet of office space, to be exceeded only if the developer can demonstrate that the excess spaces would be used by higher occupancy vehicles and/or that employees using transit be "subsidized" equitably relative to others receiving parking benefits.

It is also recommended that the City, as owner of 20% of the commercial parking supply, implement measures to encourage the lessees of City-owned parking facilities to use their spaces in accordance with City parking policies. These measures include requiring that the maximum daily rate be equal to at least four times the hourly rate, in order to give more preference to short-term, rather than long-term parkers (commuters). In addition, the ground floor, or other prime parking locations in appropriate garages should not be opened until after 10:00 A.M., so as to reserve the most convenient locations for short-term parkers.

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I. INTRODUCTION

A. Purpose of Study

This report reviews past and current Downtown Boston parking policies, trends in traffic volumes, transit ridership, environmental quality, Downtown activities and parking facilities in order to assess whether parking management goals of the City and region are met by existing programs. Modifications to these programs are recommended, where necessary, to enhance and improve air quality, economic development, and transportation in the Downtown. This work has been undertaken through a contract among the Boston Redevelopment Authority (BRA), the City of Boston and the Metropolitan Area Planning Council, supported by the U.S. Environmental Protection Agency Section 175 funds.

The importance of parking policy in the Downtown is related to its influence on transportation patterns, land use, the environment and Downtown vitality. Parking permits access to Downtown by automobile, allowing convenient transportation to work, shopping or other activities. Parking is desirable in that it provides support for Downtown uses, allowing persons to travel to the core by means other than transit, walking or bicycling.

By enabling vehicular access to the Downtown, parking thereby influences traffic volumes. Some trips must be made by vehicle, such as deliveries and service calls, but other trips for the purposes of work, shopping and recreation can be accommodated by transit. Therefore, the availability and price of parking can affect transit ridership as well. Increasing the transit share of Downtown travel is important because it can help to defray the rising MBTA deficit, which results in an increased tax burden on City residents, but also to alleviate Downtown vehicular congestion.

Downtown is characterized by density of land uses, meaning that large numbers of people desire to travel to a relatively small area, placing heavy demands on the limited street system. Furthermore, a high percentage of these trips take place within two three-hour periods of the day. This "peaking" of demand not only occurs on streets and highways leading into and within the Downtown, but also at parking facilities, resulting in queueing which can cause back-ups onto already congested streets. This congestion on Downtown streets inhibits important activities such as deliveries, services and emergency vehicles, can limit access to Downtown, thus increasing the costs of doing business in the City.

Congestion also exacerbates automobile-related environmental degradation in the form of air and noise pollution. These negative environmental impacts make the Downtown a less desirable location for residential development. Another land use impact of parking is the land required for parking facilities, which may be at the expense of other uses and objectives. Older buildings were often demolished for the purpose of constructing parking, buildings which may have been recycled for further use. Also, in the past, there had been little regulation over the design and operation of parking facilities, and many were poorly located for access and interfered with traffic and pedestrian flows.

Through the recognition of these impacts, parking policy is used to guide and influence traffic volumes, urban growth and environmental quality. Parking policy influences automobile use through the location, number of spaces and fees for vehicle storage, which directly affects the cost and convenience of driving. Similarly, the cost and convenience of access to retail, office, recreational and industrial locations influence their attractiveness and their viability vis-a-vis other competing locations. Land use patterns can be modified by restrictions on parking facility locations through zoning and other controls. Environmental quality and congestion are affected by the number, location and time of travel of automobiles destined to parking. The importance of parking policy is exhibited through all of these impacts and form the basis of this study.

B. Historical Context

Parking conditions and auto accessibility to the Downtown are closely tied to the economic vitality of the CBD, and must be viewed in that context. In the fifties and sixties the predominant planning view across the country was not only to accommodate, but to encourage auto access to the CBD as much as possible by building expressways and demolishing "obsolete" buildings for parking lots. This trend intensified in the mid-sixties as funds for urban renewal were made available by the Federal government, and as downtown areas were starting to feel the competition from outlying urban and suburban locations for industrial, retail and office activities.

Declining employment and commercial activity in the downtown should have led to less automobile congestion, but the simultaneous drop in transit patronage resulted in increased congestion and longer travel times to work. Although the attractiveness of suburban sites for business was the result of many factors, including lower land costs, population growth, outward expansion of residential areas from the city, urban crime, and aesthetics, accessibility played an important role. Convenience to new expressways and interstates, less density, less congestion, land for "free and ample" parking and proximity to the residences of more affluent workers and shoppers also gave suburban locations a boost.

In most cities, the convenience offered by the automobile became paramount and transit systems quickly deteriorated. In older transit-oriented cities such as New York, Boston and Chicago, steady declines in transit usage continued through the fifties and sixties (and into the seventies) although these transit systems still carried more commuters than did automobiles to CBD destinations and commercial activities.

Even in cities with fixed rail rapid transit, this shift of industry, business and residences to the suburbs, and the increasing reliance on automobiles for downtown commuting resulted in: underutilization of the considerable investment in public transportation; use of scarce land for parking and expressways; and more severe and lengthening traffic jams, despite the construction of more and better engineered freeways.

C. Parking Management in Boston

This situation occurred across the country in a variety of urban settings and Boston was no exception. In 1950, the City of Boston comprised 33% of the metropolitan area's population, dropping to 27% in 1960 and 23% by 1970. Confirming this trend are employment statistics, although less markedly. In 1960, the Downtown had a 20% share of the region's employment, dropping to 18% in 1970. The City of Boston as a whole lost employment relative to the metropolitan area, its proportion dropping from 44% in 1960 to 39% in 1970.

These trends did not pass unnoticed. New expressways were proposed to improve access to the Boston CBD. The Southeast Expressway (I-93), the Inner Belt, I-95, and the Massachusetts Turnpike Extension were all designed to facilitate convenient and speedy access from the suburbs to downtown. However, when land clearance began, recognition of the numbers of jobs and residences which would be destroyed or relocated became widespread. Community groups organized in opposition to the plans, and as the controversy heightened, then-Governor Sargent called a moratorium on further highway construction within Route 128 in February, 1970. This action had further significance in that it established the Boston Transportation Planning Review (BTPR) to review transportation planning policies of the past and suggestions of new directions for the future.

1. Boston Transportation Planning Review

The BTPR engaged in an extensive analysis of core and corridor transportation systems, and developed far-ranging recommendations. In 1971, at the study's conclusion, the Governor stated that there is "no way to provide sufficient highway and parking capacity while still preserving the characteristics of the region that make it a highly attractive place to live and work." Recognizing that "most trips in the region will continue to be by motor vehicles," yet, within Route 128, "future investment must concentrate overwhelmingly upon the improvement of public transportation." Therefore, new expressways designed to accommodate peak-hour travel to and in Downtown Boston would no longer be considered, because of:

- center-city congestion;
- lack of adequate off-street parking;
- competition with transit service, leading to increased transit operating deficits; and
- inescapable social disruption and environmental degradation as a result of direct displacement, air and noise pollution, visual intrusion, etc.

In conjunction with transit improvements, automobile disincentives would be emphasized using "the most effective lever available for the limitation of traffic demand - parking policy."

The primary parking strategy of the BTPR was the imposition of a "freeze on the creation of additional parking capacity in Downtown Boston and at Logan Airport, except as new spaces are offset by the elimination of existing (particularly on-street) space." Less stringent parking limitations would be considered in an area outside the "freeze" zone but within several miles of downtown.

This freeze would not apply to residential parking spaces, since "downtown residents place very little peak-hour burden on the highway system," nor to spaces that were under construction or contractual commitment at the time. Logan Airport was also intended to be part of the freeze area and it was suggested that parking facilities be constructed around Route 128 for employees and patrons, and that bus/limousine service to the airport would be provided by the Massachusetts Port Authority. A Third Harbor Crossing would be constructed to accommodate airport-bound bus/truck traffic only.

2. Zoning

In response to this emphasis on downtown parking management, the Boston Redevelopment Authority (BRA) modified the zoning codes to eliminate the incentives for developers to exceed the minimum required parking which then permitted an increase in the floor area.

Prior to BTPR, zoning for parking was predicated on requiring a certain number of spaces per square foot of structure, varying by district and by land area. This was to ensure that there would be sufficient parking to support development, and that there would not be spillover to on-street parking.

The zoning code, revised in 1973, eliminated the parking requirement for all but residential uses, and introduced the concept of a Restricted Parking District, in which non-residential parking would thereafter be considered a Conditional Use, subject to Zoning Board of Appeal approval. The Boston Redevelopment Authority, the City's planning agency, has the legal responsibility to advise the Zoning Board of Appeal.

The Board of Appeal makes the determination of conformance with the provisions of the code, that:

- the site is appropriate, and will not adversely affect the neighborhood;
- there will be no serious hazard to vehicles or pedestrians from the use.

Those provisions specific to the Restricted Parking District, of which the facility must meet one or more of the conditions are:

a. It will serve a traffic demand not adequately provided for by public transportation; or

b. It will replace existing off-street parking spaces in one or more nearby parking facilities, or it will replace legal on-street parking spaces that have been physically eliminated through permanent modification or demolition; or

c. It is accessory or ancillary to a use which by its nature does not contribute significantly to traffic flows during peak traffic periods; or

d. The facility constitutes a temporary parking lot use of land and that serious intent to reuse the land for an allowed use within a specified period of time has been demonstrated to the satisfaction of the Board of Appeal.

In addition, other conditions may be attached to the parking facility, in order to "assure harmony with the general purposes and intent of this code," including:

- screening of parking areas with walls, fencing, planting, etc., from adjoining lots or the street;
- limitation of size, method and time of operation;
- regulation of number, design and location of access drives and other traffic features.

Originally, the boundaries of the Restricted Parking District coincided with those of Boston Proper. However, EPA's 1973 freeze area (see following sections) extended to the medical area in the Fenway, and parts of South Boston and Dorchester down to Columbia Point. This large freeze area was undesirable from the City's point of view, since additional parking was needed in these areas outside of Boston Proper to accommodate the growth in medical and educational activities. Since these neighborhoods are predominately residential in nature, it was feared that shortages in off-street parking would result in extensive use of on-street spaces, exacerbating the parking difficulties of residents.

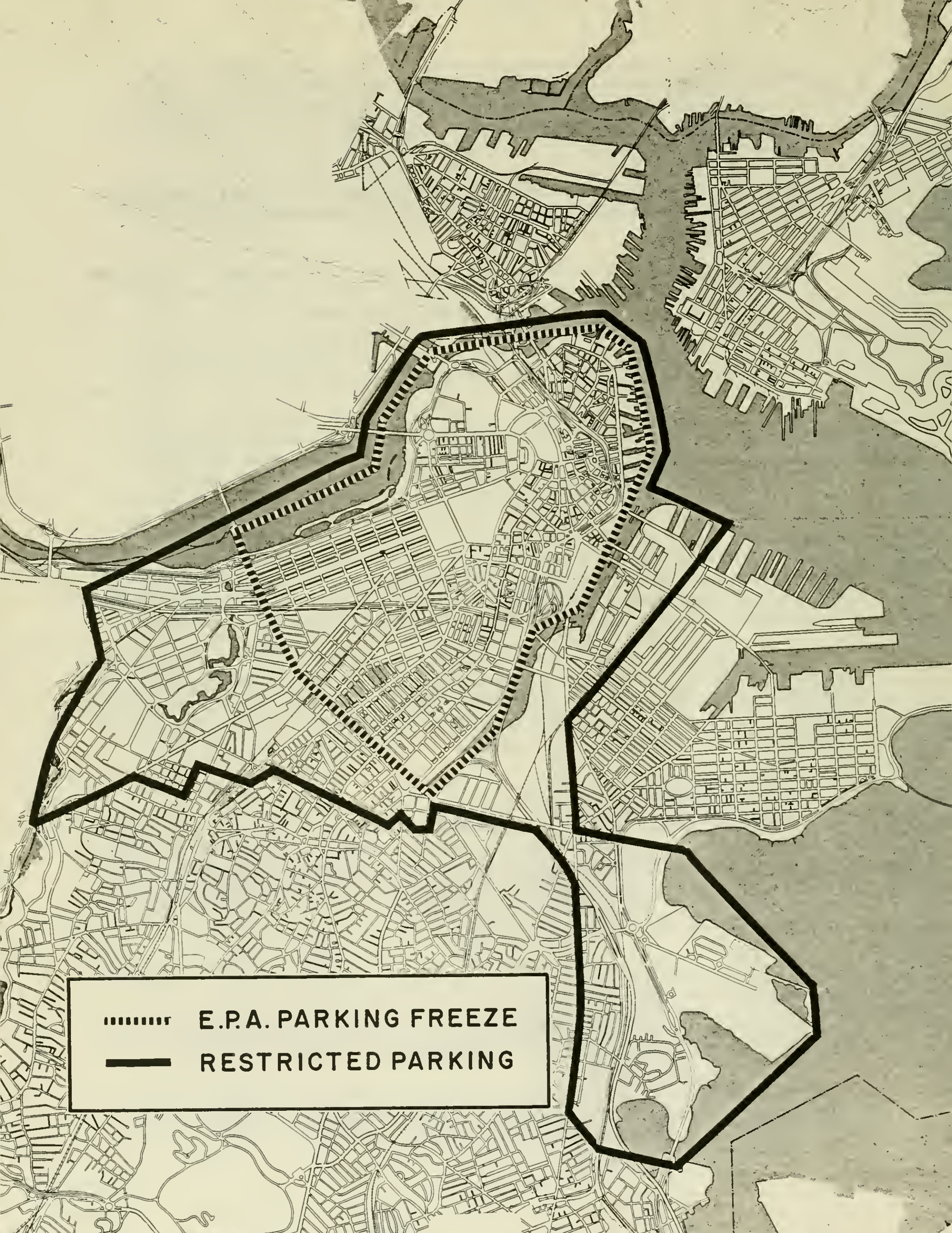
EPA was willing to reduce the freeze area to include only Boston Proper if the City would institute effective parking controls for the part of the original freeze area outside of Boston Proper. Consequently, the Restricted Parking District was expanded to include the original freeze area (shown in Figure 1) in 1976.

3. Parking Management Study

Also following from the BTPR, a consultant, Wilbur Smith & Associates, was commissioned to undertake an extensive parking study for the region, and recommend parking management strategies. Completed in 1974, the report entitled: An Access-oriented Parking Strategy for the Boston Metropolitan Area, contained much useful data and made the following observations about parking in the core:

- Highway capacity is limited, and cannot continue to absorb additional commuter travel.
- Downtown Boston's parking has developed in a random manner, and has not, for the most part, resulted from a systematic parking development program.
- Garages are, in some instances, poorly located in relation to access routes and demands, and inadequately designed.

FIGURE 1



- Open-air parking lots tend to fractionate downtown land use.
- Parking rates favor all-day parkers in most facilities.
- Extensive overtime and illegal parking along curbs reduces street-use efficiency and results in a serious undermining of downtown garage use.
- The high incidence of illegal parking indicates insufficient numbers of properly located spaces and inadequate enforcement.
- Parking space deficiences in the Financial District will continue to worsen because of growth, and lack of adequate transit service, in terms of accessibility, capacity and quality.
- Fringe parking at outlying transit stations is inadequate.
- Parking management responsibilities within the City are fractionated.[1]

Identification of these problems resulted in several parking management recommendations:

- There should be a stabilization of the total downtown parking supply.
- A policy of the progressive replacement of curb and open lot spaces with new multi-use garages should be established.
- Modification of curb and off-street parking rates to discourage commuter parking.
- Intensified enforcement of curb parking regulations.
- Improved parking facility management procedures, including enforced vacancy rates, to reserve spaces for arrivals after 10:00 A.M.
- New facilities should be tied to downtown development plans to help achieve a more rational distribution of facilities with respect to land use, development densities and access routes.
- Fringe parking at MBTA stations should be increased.
- Improved rapid transit distribution in the downtown financial and office core are essential to the long-term stabilization or reduction of Downtown Boston's parking supply.[2]

Most of these parking recommendations have been incorporated into City transportation policy, to a greater or lesser extent. Enforced vacancy rates, enforced high daily maximum parking fees, and improved rapid transit in the core are recommendations which have not been implemented systematically. However, the remaining recommendations were reinforced by subsequent Federal, State and City action, under the aegis of air quality improvements.

4. Transportation Control Plan for the Boston Region

The 1967 Air Quality Act and amendments set regional standards for hydrocarbons, carbon monoxide and nitrogen oxide, the primary mobile source (vehicular) pollutants as well as for stationary source pollutants. The 1970 Clean Air Act amendments stipulated that each state have a control plan for attainment of these standards, in accordance with a mandated timetable. The original compliance date of May, 1975 was extended to 1977 when it became clear that changes in auto "tailpipe" emissions also would not reduce pollutants to standard levels. Significant reductions in auto use would also be necessary.

The Commonwealth of Massachusetts was required to submit to EPA a plan for the reduction of automobile vehicle miles traveled (VMT) in the Boston region. They did not do so, and EPA drew up the Transportation Control Plan for the Boston Region in June, 1973.

EPA's plan for VMT reduction contained improvements which would encourage transit and carpool/vanpool use, combined with disincentives for automobile use. The plan's transportation incentives encompassed a state-assisted carpool/vanpool program, exclusive bus/carpool lanes, and preferential parking and tolls for carpools; encouragement of bicycle commuting through a network of bicycle paths; expansion of fringe park-and-ride lots; and an employer transit-pass program.

The automobile disincentives, basically parking-related, were based on much of the work of the BTPR. They included:

- A ban of on-street parking in the "freeze area" (Boston Proper) from 7:00 A.M. - 10;00 A.M. weekdays.
- Imposition of a 25¢/hour surcharge on off-street parking in the Boston core area during commuting hours.
- Setting aside 40% of all spaces in each off-street commercial parking facility for patrons who arrive after 10:00 A.M., weekdays (non-commuters).
- A freeze on the number of employee parking spaces in the Boston core area, Logan Airport, Cambridge and parts of Somerville.
- A regional restriction of employee parking, specifically a 25% reduction in the available employee parking spaces for employers of 50 or more, or that number of spaces necessary to attain a parking space/employee ratio of 0.75.
- A freeze on the construction of new parking spaces, so that the total number of parking spaces in Boston Proper (including those under construction) on October 15, 1973, not be exceeded.

Public response was quite unfavorable toward these parking proposals both locally and nationally, and in 1973 and early 1974, Congress attempted to pass legislation prohibiting parking price disincentives. Responding to this threat, EPA voided all parking surcharge regulations in June, 1974. That same administrative order authorized the suspension, until January 1, 1975 of the "applicability of any regulations for the management of parking supply or any requirement that such regulations be a part of an applicable implementation plan." However, the resumption of the federally-imposed freeze was specifically barred by subsequent Congressional action. In December, 1974, Congress prohibited the use of any funds for the promulgation or implementation of parking regulations in the EPA appropriation bill for fiscal 1975.[3] Despite this action, it was still possible for the states to submit parking surcharges or a parking freeze as part of their implementation plan.

When the revised 1975 Transportation Control Plan for the Boston Region appeared, again drawn up by EPA, many of the previously proposed restrictions were moderated and the transit, bicycle and carpool incentives were expanded.

The parking freeze was shaped into its present form in this amendment. A significant modification of the previous regulation was the application of the freeze only to commercial spaces, thereby excluding employee spaces. Although the City and the BRA had argued for the retention of employee spaces in the freeze, the overwhelming sentiment expressed by business people in the public hearings was that this would be detrimental to business and would limit their ability to attract workers to downtown. Subsequently, EPA omitted employee spaces from the freeze. This remains a controversial point, particularly since commuter traffic is the major contributor to peak-hour congestion and tailpipe source pollution, and furthermore, employees are a group which has the most transit options available to them.

The mandated 25% reduction of employee parking spaces was also changed to a target 25% reduction in the number of single-passenger commuting vehicles used by employees and students. No enforcement action would follow if a "good faith, diligent and expeditious effort" was made to encourage the use of carpools and mass transit.

The ban on on-street parking in Boston Proper was to be in effect between the hours of 7:00 and 9:30 A.M., weekdays; except for autos which had a resident parking sticker in legal spaces.

The 1977 Clean Air amendments authorized the extension of the final deadline for achievement of the ambient air quality standards for areas with severe photochemical oxidant or carbon monoxide problems (which includes Boston) to December, 1987. The amendment required that each state submit a State Implementation Plan (SIP) delineating the measures by which it will comply with the air quality standards.

The current SIP includes the transportation control measures promulgated in the 1975 plan, and is continually being updated to include strategies which will complement the effort to reduce VMT. Parking programs are important elements of the overall strategy to reduce VMT, thus this report has been funded by EPA, under the Section 175 program, in order to assess the impact that parking programs have had on VMT (and air quality) and to recommend strategies which will further contribute towards attainment of air quality standards.

D. Implementation of the Parking Freeze

Many issues had to be clarified before the freeze was actually implemented. Delegation of responsibility for administration of the freeze, the delineation of the freeze area, the mechanism by which the freeze permits would be issued, and the criteria for issuance and definition of the ownership of the freeze spaces, a potentially valuable commodity, all had to be resolved.

1. Freeze Definition and Boundaries

Because of the legal challenges to the 1973 Transportation Control Plan and uncertainty regarding many of its provisions, planning for the Parking Freeze did not fully get underway until after the 1975 revision to the Control Plan. By mid-1976 procedures and criteria had been developed and the Boston Air Pollution Control Commission (APCC) was ready to begin administering the freeze. Some of the issues of major importance contained in the regulations included:

- The 1973 revision to the zoning code establishing a restricted parking district was extended to include a wider area, and the Parking Freeze was to be applicable within Boston Proper (see Figure 1). Logan Airport was not under the APCC jurisdiction - Massport was designated as the responsible agency.

- The "freeze" definition was to apply only to spaces open to the general public where cars are parked for a fee (commercial spaces). If the general public is excluded from using the facility, for example in resident-only, guest-only or employees-only parking, an exemption from the freeze must be requested from the APCC. If the APCC is satisfied that mechanisms will be implemented which ensure restricted use, an exemption is granted.

- A ceiling of 35,503 commercial parking spaces -- those existing or under construction on October 15, 1973, would be maintained. Thereafter, eliminated commercial parking spaces and legal on-street parking spaces would revert to the bank, and become available to those desiring to establish new parking facilities.

- Rights to eliminated parking spaces cannot be transferred between persons or entities.

- Any modification of an existing parking facility or lot which increases the number of spaces available is subject to the requirements of the Parking Freeze.

- Any reduction in commercial parking spaces must be reported to the APCC.

2. Determination of Responsibility

The City of Boston became the jurisdiction responsible for administration of the Parking Freeze, and the Boston Air Pollution Control Commission (APC was designated as the lead agency for its implementation. The APCC has staff to investigate non-compliance with regulations, but is somewhat limited by budget constraints. Other City agencies were to be involved in the program. The Conservation Commission, the City's primary environmental agency, was to support the APCC in carrying out its responsibilities. The Traffic & Parking Department had the responsibility to review all applications for Parking Freeze Permits, to require this permit prior to their issuance of an operator's Parking License, (which is required for open-air lots) and to notify the APCC and BRA of all legal on-street spaces which have been physically eliminated. Review of permit applications, collection of data relevant to application and maintenance of an inventory of commercial parking spaces was the role of the BRA. Finally, the City Building Department agreed not to process applications regarding parking facilities until either a Parking Freeze Permit or an exemption was issued by APCC.

3. Criteria for Permit

The criteria for issuance of permits were designed to emphasize design and traffic management factors, in accordance with policies developed through BTPR and the subsequent Wilbur Smith & Associates study. They include that an applicant facility:

- Be located where it will not contribute significantly to peak-hour traffic flows and where surrounding sidewalks and streets can adequately accommodate pedestrians and vehicular movements;

- Provide justification of the need for such a facility, such as a deficit of parking in the vicinity, or that the facility directly serves surrounding development, and demonstrate that its design is appropriate and consistant with its surroundings;

- Be in conformance with City planning policy, which is to locate facilities on the fringes of the Downtown, reducing peak-hour traffic on interior downtown streets, and to encourage short-term, rather than all-day commuter parking.

However, the potentially difficult and expensive measurement of localized air quality impacts was determined to be unnecessary, since the Parking Freeze would contribute towards the attainment of air quality standards through a reduction in region-wide vehicle miles of travel.

E. The Parking Freeze - Operation

A survey of all parking within Boston Proper was conducted by the BRA in 1973, to be used as the "ceiling" number of spaces for the freeze. Between that date and the initiation of freeze administration in July, 1976, the construction of commercial spaces was at a "proceed at your own risk" status. The 1,111 spaces that commenced construction in the interim did, however, receive freeze permits, as 926 off-street and 446 on-street spaces were eliminated during that period.

One of the early concerns regarding the freeze was that there would be insufficient spaces available to offset spaces planned in several large garages. So far, this has not emerged as a problem. The City's Real Property Department and the BRA had control of many spaces, some of which were eliminated in order to accommodate new facilities. Also, it is not coincidence that portions of the sites of planned, large developments - Park Plaza, Copley Place and Lafayette Place - were parking lots, since undeveloped parcels are most amenable to development. Therefore, these developments received freeze credits for the elimination of on-site privately-owned lots. Because of the long lead-time required for planning and construction of garages, it has become customary to issue freeze permits in advance, identifying the spaces which would be eliminated but not subtracting them from the freeze bank balance until the permits become effective.

A chronology of freeze actions is found in Appendix A. Since the freeze has been initiated in 1973, over 3,700 spaces have been eliminated, approximately 4,000 exemptions have been given, and as of January 1, 1981, there are 523 spaces in the bank.

F. Parking Freeze Policies

Some of the major policies which have emerged from the Parking Freeze administration thus far:

Exemptions

Exemptions from the freeze are issued only when it can be demonstrated conclusively that the general public would be effectively excluded from its use. The assurances have included physical modifications to garage design and hotel keys.

Open-air Lots

Permits for all open-air lots are issued on a one-year basis only; renewable annually. The policy of the APCC is not to issue permanent permits for open-air facilities, since from land use and aesthetic aspects, garage structures are a more desirable form of parking. These temporary permits are readily available for trade-offs against new garages.

Compliance with Criteria

Several open-air lots had permits issued for less than a year, and extensions were predicated on compliance with permit conditions. Several lots were overparking, in violation of their permitted capacity. Warnings were also issued for the absence of wheelguards, marking spaces, and for lack of proper pavement. Where the conditions were not met, the permit was revoked.

Permit Denials

It is informative to examine the facilities for which permits were denied or withdrawn, since this can demonstrate the immediate effect of the criteria.

One of the most important actions of the freeze was to deny a permit to a facility at 41-49 Milk Street, in 1977. The operator's intent was to demolish a building in order to build a parking lot which was against City policy. Now the building is being rehabilitated for office use. Another request was made in 1978 to demolish a building for parking at 176 Tremont Street. Because of a negative staff report, the application was withdrawn prior to its almost certain denial, and the building is still vacant.

Another application was denied for a surface lot in the South End on Harrison Avenue, based on the criterion that it would contribute negatively to peak-hour traffic flows.

The 60 State Street garage was granted a temporary permit for the operation of 227 public spaces while the Dock Square garage was under construction, due to an immediate need for parking in the area. When Dock Square was completed, the permit expired, and the 227 spaces could no longer be open to the general public. An exemption had been previously granted, so the garage could be operated as employee-only parking. However, application was subsequently made to the APCC for a change in the status of the spaces from employee (exempt) to commercial. An unfavorable staff report followed this request, and the application was withdrawn.

Employee Spaces

The provision to exclude employee spaces from the freeze has been controversial, as noted in the previous section. In 1978, the APCC voted to expand the definition of spaces under the freeze to include employee spaces. Again, this encountered opposition from The Commonwealth, The Chamber of Commerce and the BRA. No change has been made in the freeze definition because of the Commonwealth's failure to approve the proposed modification.

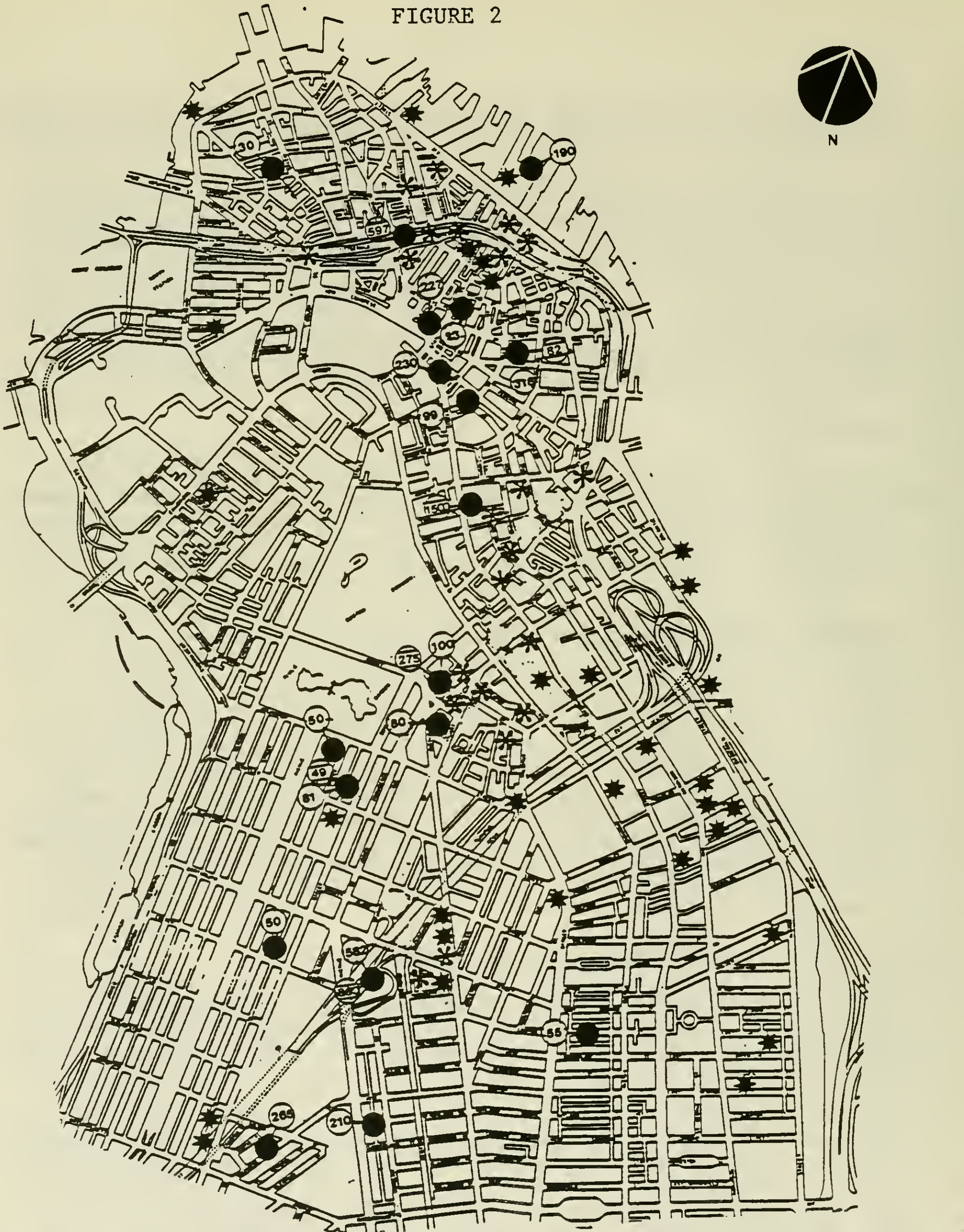
Location and Accessibility of Parking

There is a policy of providing parking trade-offs from eliminated spaces in the vicinity of a planned garage so that there is not an unwarranted redistribution of spaces from one section of the Downtown to another. A map of eliminated and new facilities is shown in Figure 2. It appears that new facilities are located along a CBD-Prudential spine, and that the parking supply is slowly moving in the direction of consolidating scattered, small surface spaces into larger garages. These garages tend to be better planned and designed than the surface lots they replace, since the new facilities have to be in compliance with the APCC criteria. Therefore, there is a trend toward the general improvement of the location, accessibility and appearance of parking in the Downtown.

G. Effect of the Freeze - Background Questions

This brief overview of the freeze mechanism provides a background for the analysis of the effects of the freeze. Some of the initial concerns regarding the freeze have been alleviated, such as its legality, the immediate availability of trade-off spaces to support large-scale development such as Copley Place, Lafayette Place and Park Plaza, and whether or not the criteria would be adhered to, when developmental or other pressure was brought to bear on the actors. However, questions still remain, regarding the availability of trade-off spaces for large future development as at North Station; the lack of flexibility caused by the exclusion of employee spaces, as well as the incompatibility of this regulation with air quality and traffic management objectives; the fear that difficulties in parking may negatively influence a developer's decision on whether to build or rehabilitate in Boston Proper; and the effect that the freeze has had on the most direct correlate of parking - automobile use, translated into changes in vehicle miles travelled, and transit ridership.

FIGURE 2



PARKING FACILITIES IN BOSTON PROPER

CHANGES BETWEEN 1975 - 1980

○ NUMBER OF SPACES EXEMPT FROM FREEZE
⊖ NUMBER OF SPACES SUBJECT TO FREEZE
✱ OPEN-TO PUBLIC FACILITY ELIMINATED
✸ PRIVATE FACILITY ELIMINATE
● NEW FACILITY (OVER 30 SPA

0 1200

II. ACCESS TO BOSTON PROPER - EXISTING CONDITIONS AND TRENDS

Accessibility to the city center is essential for its continued vitality and growth. The number of people travelling into and out of Downtown on a daily basis directly corresponds to the activities located there, and provides support for their continued viability.

Travel to the Downtown has distinctive features which set it apart from travel to other locations. The density of land uses that is characteristic of core areas generates many trips within a relatively small area. The types of trips, or trip purposes, vary with the kinds of activities found in the Downtown. Boston, like most core areas, has a concentration of office employment, but also has strong shopping, entertainment and tourist components. The time and mode of travel is strongly influenced by the trip purpose.

The reciprocal relationship between access and activity in Boston will be described through an examination of historical trends and current conditions of transportation to the core, and economic and demographic data pertaining to downtown development in the following chapters. The availability and price of parking are also important factors in modal choice, and the patterns of commuting prior to and after the inception of the Parking Freeze will be examined to ascertain if there has been any change during that time period. Trends in access will also be discussed to determine what effect, if any, the Parking Freeze may have on future commuting and CBD access patterns.

A. Automobile Travel - Existing Conditions and Trends

1. CBD Traffic Volume Trends

The two decades between 1954 and 1974 had a large increase in automobile travel to the core (see Table 1). Between those years, person trips by cars or trucks rose by 63%, whereas total trips to the CBD increased by only 14.4%. Obviously, there was a precipitous decline in transit ridership during that period. For example, between 1954 and 1964, transit ridership declined by 30%, while automobile trips increased by 40%. The ten-year period between 1964 and 1974 saw an increase of over 200,000 automobile trips/day, but this 20% rise marked a slowing down of the trend. During the same time, transit ridership declined by 11%, despite an increase in trips of 9%, which represented a doubling in the growth rate of all trips over the previous decade.

2. Recent Travel Trends

The most recent Cordon Count for Boston was taken in 1974, and there have been no surveys taken recently which are directly comparable to the Cordon Count data. The 1977 Boston Central Artery Study provides the best available snapshot of recent automobile travel - 615,000 vehicles enter and leave Downtown over a 24-hour period. Of these vehicles, approximately 6% are trucks and less than 1% buses.

Some comparable traffic volumes which may give an indication of recent traffic growth are counts of cars crossing the portals to the city: the Southeast Expressway, Massachusetts Turnpike, Sumner/Callahan Tunnels and the Mystic River (Tobin) Bridge.

TABLE 1

Summary of Persons crossing Cordon Line by Mode

6 a.m. - 12 midnight

	1954	1964	% Change '54-'64	1972	% Change '64-'72	1974	% Change '72-'74
Rapid Transit	397,714	325,903		311,507		305,175	
Streetcars	164,987	107,441		104,210		88,664	
Railroad	110,808	36,772		30,617		30,707	
Buses	82,883	63,501		47,568		50,843	
Boat	2,041	1,030		936		--	
Total Public Transportation	758,433	534,647	-30.0%	494,838	-7.4%	475,389	-3.9%
Passenger Cars	714,398	1,000,392		1,192,601		1,201,482	
Trucks	96,484	100,201		95,024		117,745	
Total-Private	810,882	1,100,593	+35.7%	1,287,625	+17.0%	1,319,227	+2.5%
Total-All Modes	1,569,315	1,635,240	4.2%	1,782,463	9.0%	1,794,616	+0.7%

Average daily traffic for each year from each year 1972-1980 is shown in Table 2. Changes ranged from a 22% increase on the Massachusetts Turnpike to an almost 4% decrease on the Tobin Bridge. (The opening of the nearby I-93 in 1973 undoubtedly played a major role in the constancy or slight decline in volumes on the Bridge). Volumes on I-93 inbound have remained relatively stable between 1974-1980.[4]

There were many factors which could have influenced automobile travel in that period, other than growth in trips to the core. Most notable are the gasoline shortages of 1973-1974 and the rapid gasoline price increases of 1979. Volumes were down on all roadways between 1973 and 1974, but the influence of gasoline prices are less conclusive, since traffic rose fairly significantly on all facilities between 1978 and 1979 but declined in 1980. Another factor in traffic volume changes over time is the growth in through-trips (see following subsection Through-trips).

a. Peak Period Travel

The 1974 Cordon Count found that 50% of the transit trips, and almost 30% of the automobile trips occurred during the hours of 7:00-9:00 A.M. and 4:00-6:00 P.M. Although it is believed that the peak periods are spreading out, data comparing 1964 and 1974 does not support that assumption, so it could be a more recent phenomenon. Data for I-93, comparing 1978 and 1980, shows an increase in travel between 6:30-7:00 A.M. and 9:00-9:30 AM.[5]

Table 3 shows a steady increase in peak-hour trips by automobile between 1954 and 1974, and a concurrent decrease in transit trips. The percentage of automobiles travelling in the peak-hours was more or less stable during that time period.

b. Through-trips

Since the Cordon Counts do not differentiate between through-trips (trips passing into and out of the core) and trips destined to Downtown, the growth in trips recorded by the Cordon Counts is not necessarily representative of the growth of trips to the Downtown. The growth of the suburban economy, and dispersion of residences and businesses (and work trips) in the metropolitan area probably accounted for a larger proportion of growth in trips (in other words, through-trips) during those decades than trips to the Downtown.

1974 data on through- versus Boston Proper-bound 18-hour vehicular trips shows a breakdown of 47% through-trips and 53% to and from Boston Proper. The split for transit trips is only 22% through and 78% core-bound. For both modes, through-trips average 38%, and Downtown-generated comprise 62% of the total trips. The more recent Central Artery survey of 24-hour vehicle trips found 2/3 of the trips were through-, compared to about 1/3 core-bound.

c. Vehicle Occupancy

In 1964, average occupancy for trips was 1.58 persons per vehicle. The 1974 Cordon Count found vehicle occupancy to be 1.54, and in the 1977 Central Artery Study, 1.46.

TABLE 2
Automobile Travel to and through Boston

Recent Trends

Two-way Average Daily Traffic

Year	Southeast Expressway @ Southampton St.	Mass. Turnpike between Allston and Mass. Ave.	Tobin Bridge* (Mystic River)	Sumner/Callahan Tunnels
1972	122,400	57,939	70,150	63,487
1973	125,400	59,930	69,711	70,206
1974	121,300	58,038	44,731[b]	67,423
1975	126,400	59,931	59,599	67,782
1976	128,200	63,357	61,533	70,544
1977	118,500[a]	66,301	62,345	70,052
1978	115,900[a]	69,239	63,904	72,489
1979	135,600	71,946	67,790	77,678
1980	133,800	70,791	67,543	75,571

a) Reconstruction of Southeast Expressway - Massachusetts Avenue ramps occurred between May, 1977 and October, 1978

b) Bridge was closed from September 10 - November 29, 1974

*These are Fiscal Years - July through June

TABLE 3

TRENDS IN PERSONS AND VEHICLES CROSSING BOSTON PROPER CORDON LINES AT PEAK HOURS

	NUMBER OF PERSONS					
YEAR	Public Transport	Private Vehicle (1)	Pedestrian	Total All Modes	PER CENT BY TRANSIT	NUMBER OF PRIVATE VEHICLES
Morning Peak Hour (8:00 A. M. to 9:00 A. M.) Inbound:						
1954	99,362	37,609	4,136	141,107	70	23,829
1964	68,682	46,042	2,223	116,947	58	33,130
1972	61,945	50,194	2,597	114,736	53	36,308
1974	59,372	51,621	NA	110,993	54	37,147
Evening Peak Hour (4:30 P. M. to 5:30 P. M.) Outbound:						
1954	105,424	40,317	5,688	151,429	69	25,897
1964	76,709	65,271	3,430	145,410	52	39,263
1972	72,030	66,878	4,457	143,365	50	39,999
1974	63,884	66,942	NA	130,826	49	42,353

---

(1) Automobiles, trucks, and taxis.

Source: Cordon Counts, Downtown Boston, 1954, 1964, 1972, 1974.

B. Transit Ridership

Table 1 shows the decline in public transit patronage that has occurred between 1954 and 1974. The 37% overall drop in ridership has been most severe in the commuter rail and streetcar modes. The termination of many commuter rail lines during this period played a factor in the loss of patronage, but undoubtedly ridership had decreased prior to the service cutbacks.

The drop in rapid transit ridership between 1964 and 1974 was most likely tempered by the opening of the Quincy Red Line extention, and the increase in bus ridership can be partially attributed to the introduction of the Turnpike express bus service.

Ridership data has not been collected in a similar fashion since 1974 so that recent trends are more difficult to establish. However, system-wide ridership estimates show a slight, but continual increase since 1975 (see below). Average weekday passengers on the basic MBTA system (excluding commuter rail) has increased from 480,000 in 1975 to 529,000 in 1980. It can be assumed that ridership to the core area has risen at a proportionally higher rate, since suburban bus routes have been cut back to a greater extent than radial Downtown-oriented service, and off-peak service has generally been more of a target for money-saving efforts than the generally well-patronized commuter service, comprising over 50% of core-bound transit ridership.

MBTA Systemwide Average Daily Ridership

Trends - 1975 - 1980

1975	480,000
1976	487,000
1977	491,000
1978	506,000
1979	520,000
1980	529,000

Transit Rider Characteristics

The most recent survey of MBTA ridership was taken in April, 1978 by the Central Transportation Planning Staff. The daily boardings (persons passing through turnstyles into the station) at each of the rapid transit stations is shown in Table 4, and some salient characteristics of MBTA riders in Table 5. This data will be compared later in this paper to characteristics of parkers in the Downtown, but it can be noted that MBTA riders tend to be less affluent than average, are predominantly female, use the system more for work trips than any other kinds of trips, and the majority may not have an auto available to them to make their trip (transit dependents).

One interesting finding of the survey is that 1/2 of the riders said that they have increased their usage of the MBTA in the previous two years, reinforcing the indications that transit ridership has risen.

Average Weekday Boardings - MBTA Rapid Transit System

April, 1978

Downtown Boston Stations	Total Boardings
North Station	7,256
Haymarket	8,066
State	13,635
Washington	25,559
Essex	5,903
Dover	3,037
Northampton	3,711
Government Center	10,799
Park	24,723
Boylston	4,809
Arlington	11,007
Copley	13,246
Auditorium	7,979
Prudential	2,166
Symphony	2,064
Aquarium	1,681
Bowdoin	2,013
Charles	6,654
South Station	9,810
Science Park	722
TOTAL: Downtown Stations	164,840
Line Segment Name	
North Shore/Blue Line	18,264
Orange Line North	19,521
Northwest/Red Line	37,783
Green Line (Lechmere)	6,404

TABLE 5

MBTA Rapid Transit Passenger Survey, 1978

(From MBTA Systemwide Passenger Data Collection Program, Vol. I, Rapid Transit System, October, 1980, Central Transportation Planning Staff)

Trip Purpose

Work Trips -	53.6%
School Trips -	12.6%
Home-based Other - (between home and shopping, medical, etc.)	17.5%
Non-home Based -	16.3%

Age Compared to Boston SMSA (excluding under 16)

Age	Survey of MBTA Riders	Boston SMSA (updated 1970 Census)
16-24	31.3%	22.5%
25-44	45.7%	32.2%
45-59	15.3%	23.2%
60-64	3.8%	6.4%
65+	4.0%	15.7%
TOTALS:	100% of 352,251	100% of 1,972,046

Sex

	Survey	Boston SMSA
F	54.8%	52.7%
M	45.2%	47.3%

Household Income	Survey	Boston SMSA
$ 0-$ 4,999	10.1%	6.1%
$ 5,000-$ 7,999	10.3%	6.7%
$ 8,000-$11,999	16.1%	14.3%
$12,000-$14,999	11.8%	6.4%
$15,000-$19,999	14.7%	20.2%
$20,000-$24,999	12.7%	16.2%
$25,000+	24.3%	30.1%

Auto Ownership

Autos owned per Household	Survey	Boston SMSA
0	27.3%	24.0%
1	43.1%	49.0%
2	22.0%	23.2%
3+	7.0%	3.8%

TABLE 4 (continued)

Line Segment Name	Total Boardings
Green Line (Kenmore)	9,473
Riverside, Cleveland Circle and Boston College	40,259
Orange Line South	24,850
Red Line - Ashmont and Quincy	48,062
SYSTEM TOTAL:	369,456

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3+	7.0%	3.8%

C. Pedestrian and Bicycle Modes

1. Pedestrian

It has been estimated that over 5% of downtown workers walk to work (see Table 18). This amount is quite sensitive to distance and probably decreased through the 1950's and 1960's, as the South End, West End, North End and Back Bay lost population. In recent years, the number of persons walking to work Downtown has increased, and will continue to rise slightly, as more residential development occurs in and near Downtown and as downtown employment maintains its growth.

2. Bicycle Commuting

Use of bicycles for Downtown commuting has shown a definite increase in the past five years. Peak period counts of cyclists at major access points to the city show increases between 15% and 53%. The highest peak-hour count in 1980 at an access point to the city was 449 cyclists, recorded at the Harvard Bridge. The only Downtown count was at Beacon and Charles Streets where 125 cyclists passed through during the peak hour.

D. Summary - Access Trends

Travel to the Boston core is continuing to increase, although at a slower rate than exhibited in the past. Most of this increase in travel has been the result of increased automobile trips, but a reversal of the decline in transit ridership has recently been observed.

A major component of traffic on the roadways leading into the CBD is through-traffic, which has had considerable growth over the past decade or more.

During peak periods, many of the roadways leading into and out of Downtown operate at poor levels of service, however, for most of the day, at most locations, congestion is not a problem. Given that automobile occupancy is about 1.5 person/vehicle, there exists much potential to increase the number of persons travelling into the city by automobile but not adding to congestion.

Programs for staggered work hours hold promise as a way of reducing peak period congestion (although they may lengthen these periods), thus not contributing as much to CO levels, but yet accommodating auto access to Downtown.

If it is agreed that the objective of restricting automobile travel to Downtown should not discourage access to Downtown, then travel options must be available which are attractive competitors with single-passenger automobiles. Carpools and vanpools can be one option for commuters - but to Downtown Boston transit will continue to carry more commuters than the private auto.

At present, the transit system is basically operating at capacity during peak hours, although this is not necessarily so on many lines for the duration of the peak periods. There are some soon-to-be completed transit projects which will give a boost to the system, such as Southwest Corridor and South Station, but it appears that the immediate future funding problems portend declining transit service.

This is a crucial issue for many reasons. However, if the City wants to continue to attract office and retail development, increasing employment, shopping opportunities, tourism, entertainment, etc., yet wants to limit automobile trips to the City, viable alternatives must be made available in order to achieve both objectives.

III PARKING - EXISTING CONDITIONS AND TRENDS

The parking supply in Boston is comprised of a diminishing number of on-street spaces (approximately 4,000) and approximately 55,500 off-street spaces. Downtown parking supports CBD land uses in several ways. Short-term parking at meters, in lots and garages enables persons to conveniently come Downtown from diverse locations and conduct personal business, shop, attend shows, etc. The convenience and speed of the automobile, especially in the off-peak, exceeds the advantages of transit, particularly from locations outside the city. There are certain categories of travellers making discretionary trips who would not travel Downtown unless it was convenient for them to do so.

The other category of parkers are those who park all-day, and are predominately downtown workers. The majority of these commuters pay for parking in facilities open to the general public; approximately 13,000 spaces are provided by employers for their employees only. This category of parkers usually arrives in the city between 7:00 and 9:00 A.M., leaves between 3:30 and 5:30 P.M., and thus is a major contributor to CBD peak period congestion. Their regular hours coincide with the times transit service is most frequent, and furthermore, public and private bus and rail service is oriented toward the CBD. Despite the cost of automobile operation, parking fees and downtown congestion levels, many individuals still opt to drive downtown.

This section will examine the parking supply in Boston Proper and the characteristics of parkers and will set the stage for the evaluation of parking programs in Boston.

A. On-street Parking

1. Location

In Boston Proper, on-street parking in non-residential areas is generally restricted to metered spaces. There are about 3,500 metered spaces, and several hundred legal non-metered spaces outside of residential neighborhoods. The six residential neighborhoods within Boston Proper: Back Bay, Beacon Hill, Bay Village, Chinatown, South End, and North End contain 1,000 metered spaces, and restrict on-street parking only where signed. Figure 3 shows the location of on-street parking within Boston Proper.

On-steeet parking is the most convenient form of parking, and therefore meters are used to ensure a turnover of cars on streets where there is a high demand for short-term parking. At present, 80% of the meters within Boston Proper cost 25¢ per half-hour and the majority of the remaining meters 10¢ per half-hour. This fee is far below the rates at parking facilities, which paradoxically are more time-consuming to enter and exit and are generally not as well located in relation to one's destination. Consequently, the City of Boston Traffic & Parking Department has recently implemented a program to raise the meter fees up to 25¢ per 15 minutes, with a one-hour maximum.

In most of Boston Proper, there is no parking permitted from 7:30 A.M. to 9:30 A.M. and 4:00 P.M. to 6:30 P.M., and no parking permitted anytime, other than at meters, within the area roughly surrounding the Downtown

Crossing. Other than the usual prohibitions from parking in loading zones, crosswalks, etc., there are three neighborhoods - Beacon Hill, Bay Village and St. Botolph Street that have residential parking programs. An automobile without a sticker indicating residency in that neighborhood can park only in designated areas, or it will be ticketed. Because of the proximity of high-density in-town residential neighborhoods to commercial areas of the city, curb parking by non-residents makes it more difficult for residents to find parking. Therefore, several other neighborhoods - including parts of the South End, Back Bay and North End are being considered for expansion of resident parking programs.

The number of curb spaces within Boston Proper has decreased over the past decade due to the Downtown Crossing (where no parking is permitted at anytime), new development, the institution of residential parking, EPA's policy of prohibiting peak-period parking within Boston Proper, and a general policy of eliminating or restricting on-street parking in instances where traffic flow can be improved with the use of an additional lane.

2. Usage

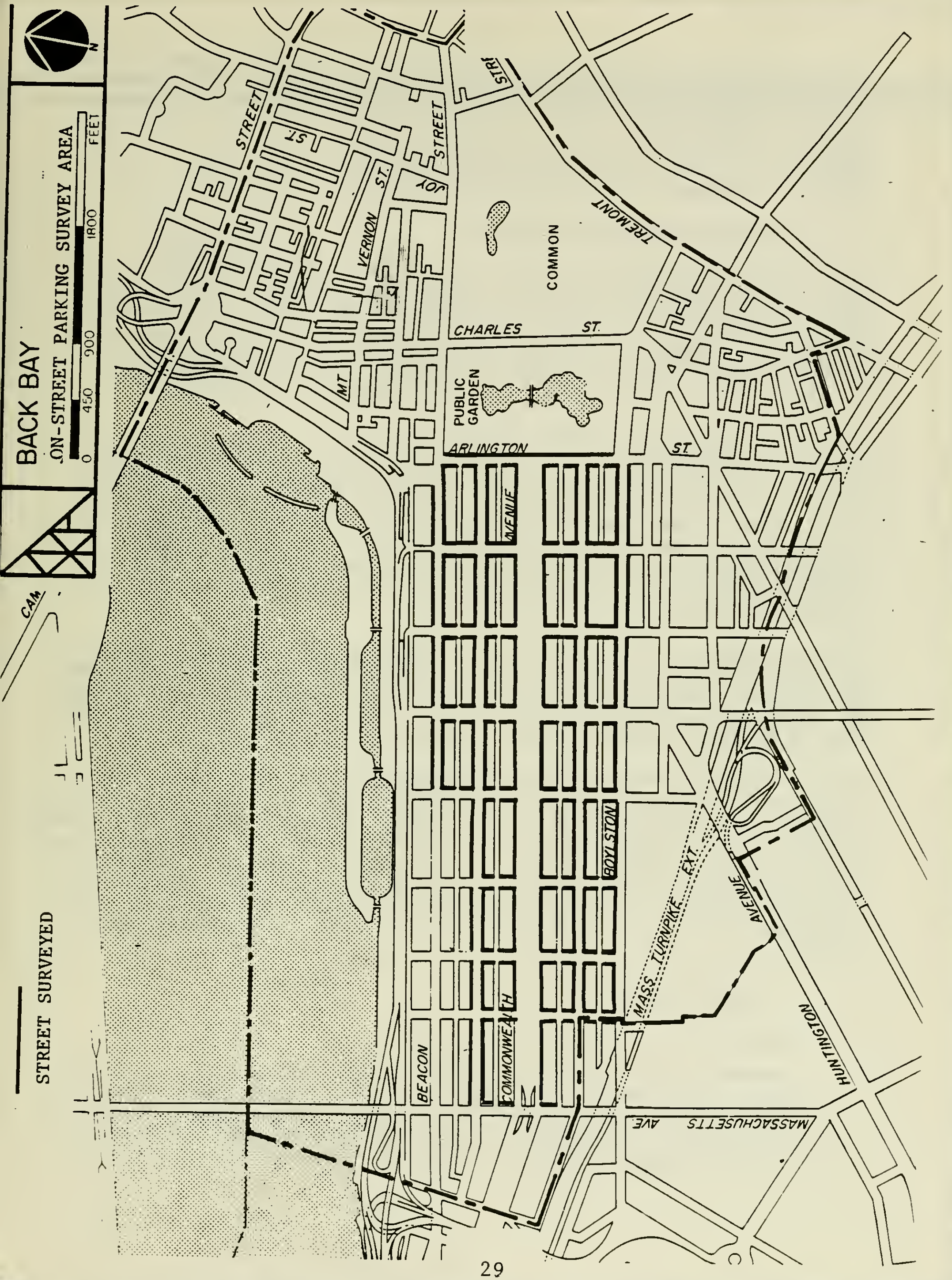
On-street parking is valuable in that it permits easy access to business, and its value is increased if there is a frequent turnover of automobiles in spaces. Ideally, longer-term parking should be provided for in lots and garages. At meters, frequent turnover is only ensured with a good ticketing program (see the following section on "Enforcement and Illegal Parking").

A survey of on-street parking was conducted as part of this study. The Back Bay was chosen to be surveyed since it is an important CBD retail area relatively well supplied with on-street parking (see Figure 4). Also, it is a neighborhood that is being considered for residential parking because of a shortage of residential off-street parking, and the interweaving of the residential and commercial areas of the Back Bay, causing the streets of the Back Bay to be used heavily for parking by students, employees and shoppers.

The full survey results are found in Appendix B. However, the key findings of the survey of 5,000 cars were:

- The turnover rate throughout the study area for legally parked cars was on the average, at least 1.96 for the hours between 9:00 A.M. and 3:00 P.M.
- The turnover rate for illegally parked cars was higher.
- 12% of all cars surveyed were parked in illegal locations.
- 12% of all cars surveyed had out-of-state license plates.
- On predominately commercial streets, cars parked all day (9:00 A.M. to 3:00 P.M.) constituted 10% of all autos; in residential areas, 13%; and overall 12%.

The recorded turnover rate is lower than the actual rate, since cars were surveyed at two-hour intervals, rather than one-hour, which is the permitted


BACK BAY
ON-STREET PARKING SURVEY AREA
0
450
900
1800
FEET
N
STREET SURVEYED
CAM
STREET
ST.
STREET
JOY
MT. VERNON ST.
COMMON
TREMONT
CHARLES ST.
PUBLIC GARDEN
ARLINGTON
ST.
AVENUE
COMMONWEALTH
BEACON
BOYLSTON
MASS. TURNPIKE EXT.
AVENUE
HUNTINGTON
MASSACHUSETTS AVE

time at most meters in the area. However, there is much overtime parking, as shown by the all-day parking figure of 12%, indicating that the illegal parking estimate of 12% is undoubtedly low. Only parking in illegal spaces was recorded as "illegal", not cars parked overtime at meters, and furthermore, parking in illegal spaces tends to have more frequent turnover than legal spaces. This misuse of on-street spaces can be attributed to problems in traffic enforcement and collection procedures.

3. Enforcement and Illegal Parking

Traditionally, adherence to parking regulations in Boston Proper has been poor. At one time enforcement was lacking, but now the chances of being tagged in the CBD for illegal parking are much increased. Enforcement is the responsibility of the Traffic & Parking Meter Maid Division and the Police Department. Available enforcement tools include tagging, towing and the "Denver Boot", which is installed to immobilize an auto which has been recorded as collecting five or more unpaid violations.

Recently the breakdown of the collection process for violations has been of concern - not only because of revenue losses, but also for enforcement purposes. Presently, court summonses are being mailed for 1977 violations, so there is an obvious lack of swift and certain retribution for illegal parking. The current payment rate of 20%[6] indicates poor follow-up of enforcement, and underscores the implicit incentives which exist for illegal parking. It is estimated that over 1.8 million summonsable tickets worth $17.5 million are currently outstanding.[7] Adding on to this figure the court fees and late penalities, the City is owed over $28 million.

The significance of the 12% out-of-state license plates found in the Back Bay (a similar survey in the South End found 9%) is that their owners feel even more immune from being identified and sent court summonses, so out-of-state automobiles are more likely to park illegally with impunity. Reinforcing this view is the fact that 20% of tickets issued are for out-of-state vehicles.[8]

As of May, 1981, the City and Boston Municipal Court have entered into a contract with a private concern for modernization of the collection process. A computerized system will keep track of unpaid violations, and after six notices, the Registry of Motor Vehicles, which has the authority to revoke Massachusetts licenses to operate motor vehicles, will be notified. When the collection of parking fines rises to the levels found in other large cities, traffic flow and safety will improve, turnover in metered spaces will be more frequent and most likely there will be an increase in the utilization of off-street parking facilities.

B. Off-street Parking

1. Inventory

Summaries of the numbers of parking spaces, facility types and ownership in Boston Proper as of 1980 are found in Tables 6 and 7. Spaces which are open to the general public (subject to the Parking Freeze), or in other words, "commercial" spaces, amount to 35,239, which is under the Freeze ceiling of 35,503. The actual number of operating spaces is

TABLE 6

Summary of Off-street Parking in Boston Proper

	# of Lots	Lot Spaces	# of Garages	Garage Spaces	Total Spaces
Open to Public "Commercial" Covered by Freeze	109	7328	48	27911	35239
Non-Commercial Spaces "Restricted"	168	10801	47	9457	20258
TOTAL		18129		37368	

TABLE 7

Ownership and Facility Type

	# of Facilities	"Freeze" Commercial Spaces	# of Facilities	*Restricted Spaces	Total
Privately-owned lots	98	6140	125	7156	13296
Privately-owned garages	38	18219	40	7998	26217
Publicly-owned lots	11	1188	43	3645	4833
Publicly-owned garages	10	9692	9	1459	11151
	157	35239	217	20258	55497

*Restricted includes spaces open only to employees, customers, visito hotel guests or residents.

**Totals include the following spaces under construction as of Decembe 1980:

Commercial spaces = 2484
Restricted spaces = 2340

somewhat less than 35,239, since that total includes some spaces under construction, but does not exclude temporary spaces which will be eliminated upon the completion of these parking facilities.

Over 20,000 spaces are not subject to the Freeze, or about 35% of the total number of off-street spaces in Boston Proper. As shown in Table 8, the vast majority of restricted spaces (not open to the general public) are privately owned, and 2/3 of these are employee spaces.

Privately-owned lots with restricted spaces tend to be the smallest facilities, with an average of 57 spaces, while privately-owned garages open to the public average almost 500 spaces per facility.

Average parking fees, by type of facility, are shown in Table 9. Publicly-owned facilities tend to be less expensive than privately-owned. The average daily maximum for public lots is 20% less than that of private lots, and the differential for garages is slightly less.

For all facilities, the average daily maximum rate is reached between 2½ and 3 hours of the average hourly rate. This rate schedule gives preference to long-term parkers, which is at odds with City policy, which encourages flat hourly rates or high daily maximum, perhaps equal to four hours or more times a flat hourly rate.

A small number of facilities with restricted use charge for spaces, also seen in Table 9. Their rates are competitive with those in commercial parking facilities.

2. Characteristics of Parkers

The Downtown Crossing surveys, taken in both 1978 and 1980, outline some of the salient characteristics of persons parking in the Downtown. Since the survey method was to reach primarily non-employees exiting parking facilities between 10:00 A.M. and 4:00 P.M., this survey does not sample the majority of regular commuters. However, the information is useful in determining changes in parking over-time, and to give profiles of non-commuters.

It can be seen in Table 10 that auto occupancy appears to be on the rise, which would be expected as the price of gasoline continues to increase and due to funding limitations, it becomes increasingly difficult to provide acceptable transit service. Two-thirds of the parkers surveyed were male, and the median income was over $30,000. This contrasts with the transit rider characteristics, found in Figure 7, in which a majority of riders were female, and median income is under $20,000. These two statistics, in addition to the 80% or greater representation of suburban parkers, present the average parker as being male, from outside the City, and more affluent than the regional average.

Of note is the 6% increase in average time parked, whereas the average parking cost has risen by 44%. This is substantially higher than the rate of inflation, and could be a result of several factors. The general stability of parking supply, coupled with rising demand, could allow

TABLE 8

Restricted Spaces Summary

	Lots	# of Spaces	Garages	# of Spaces	Total Spaces
Privately-owned:					
Employees only	75	5069	13	3396	8465
Visitors	15	621	0	0	621
Residents	22	931	17	2958	3889
Hotel Guests	0	0	8	1567	1567
Customers	13	535	2	77	612
TOTALS:	125	7156	38	7998	15154
Publicly-owned:					
Employees	40	3484	9	1459	4943
Visitors	0	0	0	0	0
Residents	3	161	0	0	161
Hotel Guests	0	0	0	0	0
Customers	0	0	0	0	0
TOTALS:	43	3645	9	1459	5104
TOTALS: Public and Private					
Employees	115	8553	22	4855	13408
Visitors	15	621	0	0	621
Residents	25	1092	17	2958	4050
Hotel Guests	0	0	8	1567	1567
Customers	13	535	2	77	612
TOTALS:	168	10801	49	9457	20258

TABLE 9

Average Weekday Parking Rates by Type of Facility - Rates, Summer, 1980

Spaces open to Public

Facility Type	#	Public Spaces	Av. First ½ Hr. Rate	Min.	Max.	Av. First Hour Rate	Min.	Max.	Av. Daily Max. Rt.	Min.	Max.
Privately-owned Lots	97	6080	$1.00	$0.50	$3	$1.75	$0.50	$4	$4.25	$1.00	$15.00
Privately-owned Garages	38	18219	$1.00	$0.75	$2	$1.75	$1.00	$3	$4.68	$2.00	$ 9.00
Publicly-owned Lots	11	1188	$0.94	$0.25	$3	$1.25	$0.25	$3	$3.39	$2.25	$5.25
Publicly-owned Garages	10	9692	$0.82	$0.50	$1	$1.28	$0.50	$2	$3.89	$3.25	$4.25

Private Spaces

	# of Facilities	Spaces	Average 1 Hour	Average Maximum
Employees-only	5	1161	$1.19	$3.60
Visitors-only	2	136	$2.00	$4.25
Hotel Guests	2	350	$1.25	$4.50
TOTAL:	9	1647	$1.27	$3.84

CHARACTERISTICS OF PARKERS

Exiting Parking Facilities between 10:00 A.M. - 4:00 P.M.

Comparisons between 1978 and 1980

	1978	1980
Auto Occupancy	1.69	1.77
Sex of Parker	61% M 39% F	62% M 38% F
Age		
16-24	12%	13%
25-35	35%	26%
35-44	16%	24%
45-64	32%	32%
65+	5%	5%
Trip Purpose		
Work	30%	43%
Shop	23%	20%
Personal Business	14%	12%
Work-related Business	18%	12%
Entertainment	1%	2%
Sightseeing	8%	2%
Other	6%	9%
Trouble Parking?		
Yes	37%	22%
No	63%	78%
Income of Parker		
	$ 0-$ 4,999 2%	$ 0-$ 5,999 3%
	$ 5-$ 9,999 4%	$ 6-$11,999 5%
	$10-$14,999 19%	$12-$17,999 15%
	$15-$24,999 30%	$18-$29,999 24%
	$25,000+ 45%	$30,000+ 53%
Average Time Parked	3 hrs., 15 min.	3 hrs., 26 min.
Average Parking Cost	$2.36	$3.40
Home Zone		
	Boston 20% Other 80%	Boston 17% Other 83%

parking operators to raise their fees. This situation could be exacerbated by the loss of several hundred public on-street and off-street spaces located within two or three blocks of the Crossing. However, available statistics show an average decline in parking lot occupancy in the vicinity of the Crossing between 1978 and 1980 (see following section). An increase in vehicle occupancy and mode split to transit among shoppers and employees may account for this. Overall, those who had trouble parking dropped from 37% to 22% in 1980, but for shoppers this percentage rose from 23% to 38%.

The different markets that various parking facilities serve are delineated in Table 11. Of particular note is that 40% of the on-street parkers were residents of Boston, but only 6% of off-street parkers in Province Street, Pi-Alley and Woolworth's were Boston residents. Auto occupancy was substantially higher in Quincy Market (2.38) than Woolworth's (1.39), perhaps accounted for by the difference in trip purposes served by each facility.

3. Parking Utilization

The Downtown Crossing survey computed parking capacities versus usage for several groups of facilities as shown in Table 12. At 10:00 A.M., vacancies amounted to 58% of capacity, and at 12:00 P.M., on the average, only half of the parking spaces surveyed were occupied. This composite of the years 1978 and 1980 indicates that there is excess capacity in these shopper/visitor-oriented facilities. However, commercial facilities in other sections of Boston Proper, such as the Financial District, are found to be generally operating near capacity.

C. Changes in Parking Over Recent Years

The supply of parking has changed over the past decade or more - in terms of number, type, fees and locations. It is of interest to examine these changes, and determine which have been a result of the Parking Freeze, and those that are attributable to other factors.

1. Number of Spaces

Table 13 contains the numbers and types of spaces found in surveys of parking facilities in Boston Proper in the years 1968, 1973, 1977 and 1980. The number of open-to-general-public spaces, or commercial spaces rose by almost 40% between 1968 and 1973 as a result of the unprecedented building boom in Downtown. Between 1968 and 1972, almost 4.5 million square feet of new office space was completed, representing almost a doubling of development activity occurring over the previous five-year period. Due to the imposition of the Freeze, there has been no growth in public spaces since 1973.

Private spaces, or those "restricted" to certain patrons, however, have continued to grow since they are not subject to a Freeze. Between 1968 and 1973, restricted spaces grew by 28%, somewhat less than the 38% growth in commercial spaces over the same time period. As commercial spaces were held constant, restricted spaces rose by almost 2,000, or 11% between 1973 and 1977, and by over 1,000 between 1977 and 1980 (see Figure 5).

TABLE 11

MISCELLANEOUS PARKING STATISTICS -- BY FACILITY

Summer, 1980

CARS EXITING BETWEEN	Quincy Mkt. Lot and Dock Sq. Garage	Under Common Garage	Beach St., Kilby, Fort-Hill, E-8, Harbor Towers Kingston-Bedford	Province St., Pi Alley, Woolworth's	Prudential	Misc. On-street (near ARZ)	TOTAL
10:00 A.M. - 4:00 P.M.	664	574	1463	872	1000	728	5952
Trip Purpose							
Work	23%	43%	51%	45%	38%	41%	43%
Shop	24%	20%	25%	15%	32%	24%	20%
Personal Business	18%	10%	5%	14%	7%	8%	12%
Entertainment	10%	3%	1%	-	1%	3%	2%
Work-related Business	15%	12%	10%	20%	10%	18%	12%
Sightseeing	10%	4%	3%	-	1%	-	2%
Other	-	8%	5%	6%	11%	6%	9%
Auto Occupancy	2.38	1.65	1.69	1.39	1.79	1.56	1.77
Time Parked (Average)	2 hrs., 33 min.	3 hrs., 50 min.	3 hrs., 53 min.	3 hrs., 1 min.	3 hrs., 29 min.	1 hr., 55 min.	3 hrs., 26 min.
Parking Cost (Average)	$4.37	$2.27	$3.04	$4.61	$2.91	$0.74	$3.40
Home Zone							
Boston	7%	10%	11%	6%	18%	40%	17%
Inner Communities (w/in 128)	21%	43%	29%	48%	38%	19%	31%
Outer Communities	72%	47%	60%	46%	44%	41%	52%
Household Income							
$ 0-$ 5,999	6%	2%	2%	1%	1%	11%	3%
$ 6-$11,999	0%	9%	2%	2%	3%	17%	5%
$12-$17,999	6%	10%	14%	10%	9%	17%	15%
$18-$29,999	24%	33%	22%	21%	26%	26%	24%
$30,000+	64%	46%	60%	66%	61%	29%	53%

TABLE 12

ANALYSIS OF ACCUMULATION AND CAPACITY FOR SELECTED LOCATIONS

LOCATION	TOTAL CAPACITY	REMAINING CAPACITY AT 10:00 A.M.	REMAINING CAPACITY AT NOON
DOWNTOWN CROSSING GARAGES			
Woolworth Garage	900	302	236
Province St. Garage	290	160	152
Pi Alley Garage	600	424	350
Subtotal	1790	886	738
DOWNTOWN CROSSING FRINGE GARAGES			
Shopper Garage	500	224	187
Hayward Place Garage	700	577	545
Kingston/Bedford Garage	735	635	526
Kilby Street Garage	700	463	417
Fort Hill Square Garage	650	448	393
Subtotal	3285	2347	2068
DOWNTOWN CROSSING LOTS			
Bedford Street Lots	286	52	24
Subtotal	286	52	24
BOSTON COMMON			
Boston Common	1500	725	588
Subtotal	1500	725	588
TOTAL	6861	4010	3418

Source: Draft Report, Parking Study, MIT Center for Transportation, 1981

TABLE 13

Parking Spaces - 1968 to 1980

	1968[1]		1973		1977		1980	
Public Parking	Facilities	# of Spaces	Facilities	# of Spaces	Facilities	# of Spaces	Facilities	# of Spaces
Lots open to public	155	11038	136	8507	126	8583	109	7328
Garages open to public	32	14625	49	26996	48	26551	48	27911
TOTAL:	187	25663	185	35503	174	35134	157	35239
Restricted Parking								
Lots for private use	187	10510	188	9375	199	10199	168	10801
Garages for private use	13	2968	23	7838	25	8949	47	9457
TOTAL:	200	13478	211	17213	224	19148	215	20258
GRAND TOTALS:		39141		52716		54282		55497

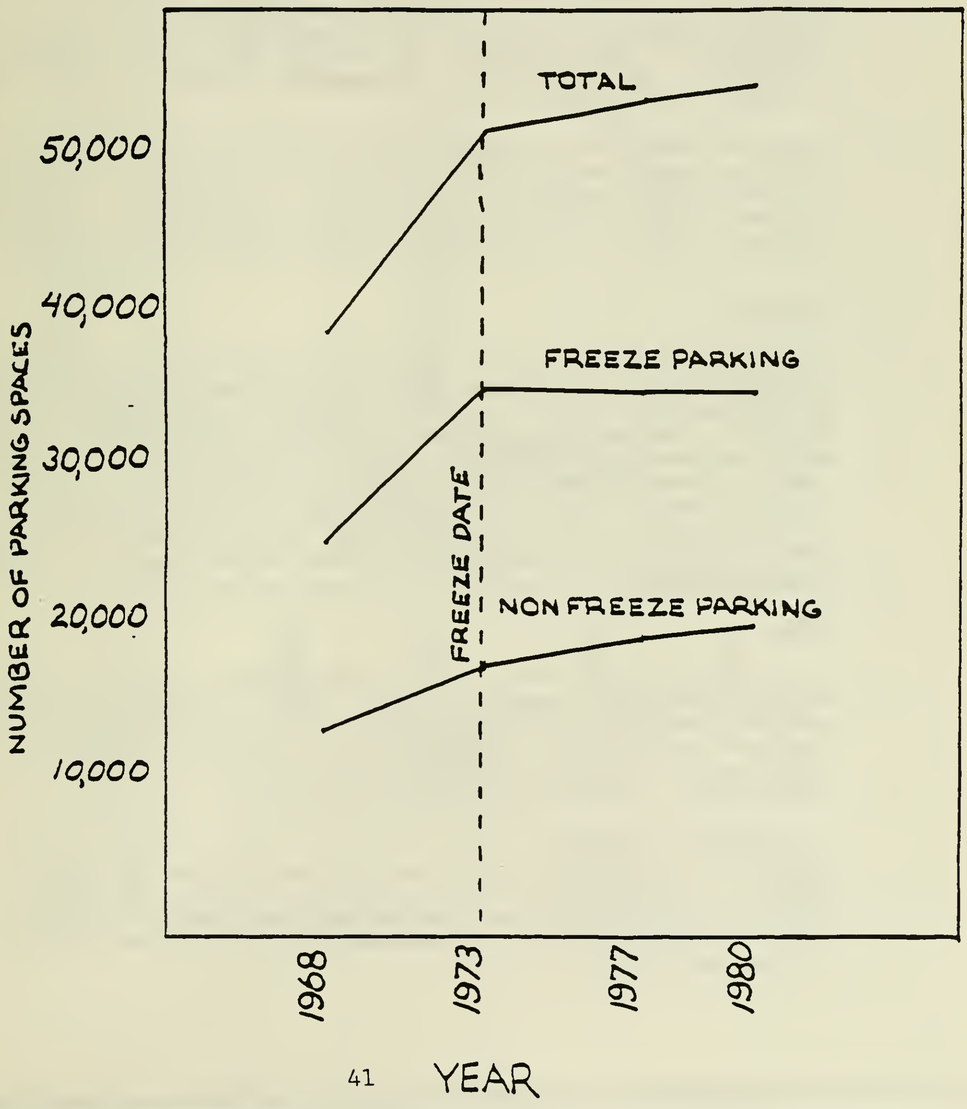
---

(1) From 1968/1969 Transportation Facts for the Boston Region

Note: Included in all totals are spaces that were under construction.

FIGURE 5

TRENDS IN THE NUMBER OF OFF-STREET PARKING SPACES IN BOSTON PROPER 1968-1980



2. Type of Facility

There has been a steady shift from lots to garages since 1968, for both restricted and commercial facilities (see Figure 6). Lots open to the general public have decreased in number by 46, and restricted lots by 19. Garages open to the public have increased by 50%, and the number of spaces therein has almost doubled between 1968 and 1980. These figures highlight the trend toward the phasing out of lots in favor of garages, and the consolidation of spaces in larger facilities.

The number of restricted-use lots has decreased, particularly since 1977, but the total number of spaces in restricted lots has remained quite stable. Again, the growth in private (restricted) spaces has been absorbed in garages, but in contrast to public spaces, there has been a proliferation of smaller facilities. The average capacity of restricted garages built since 1977 is about 125, whereas commercial garages average a capacity near 1,000.

Since the initiation of the Parking Freeze concept in 1973, over 1,700 restricted spaces have been eliminated, the vast majority of these being lots with average capacity of around forty. A complete list of eliminated facilities is found in Appendix C. Similarly, the eliminated commercial facilities tended to be lots, although on the average they had higher capacities.

3. Location

Referring both to Appendix C, which lists all new and eliminated public and private spaces, and Figure 2, which graphically presents changes in parking facilities of over 50 capacity since 1973, a slight pattern can be discerned. New facilities have been associated with large new developments, and tend to have higher capacities than the facilities that they replace. There appears to be a reduction in facilities on the fringes of developed areas - such as the Waterfront and near the South End, rather than within densely developed areas and an increase in those located along an axis linking the Government Center - Downtown Crossing - Prudential areas.

4. Rates

The average price of parking for one hour in 1972 was under a dollar, and the average daily maximum as $2.50. Table 14 compares these rates with 1980 average rates, and converts the 1972 fees into 1980 dollars. The rates have generally corresponded to the increase in inflation, the hourly rate in 1980 being slightly higher than would be expected due to inflation alone, and the daily maximum, slightly less.

One significant difference between the years is that, in 1972, the ratio between the average hourly rate, and the daily maximum was approximately 3. In other words, after three hours of parking, the daily maximum was reached and there was no additional charge. In 1980 this ratio dropped to 2.7, which as aforementioned, is contradirectional to City parking policy.

FIGURE 6

TRENDS IN THE NUMBER OF PARKING FACILITIES (PUBLIC & PRIVATE)

BOSTON PROPER

1968-1980

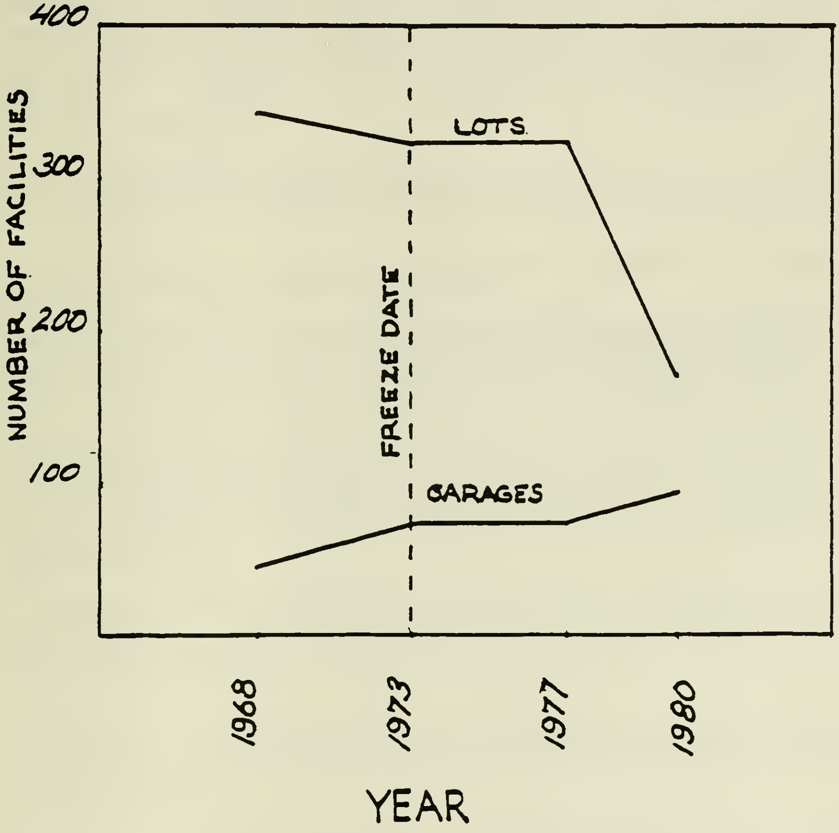


TABLE 14

Average Price of Parking, 1972 - 1980

	1972 Average	1972 Averages in 1980 Dollars	1980 Average
½ Hour	$0.60	$1.08	$0.94
1 Hour	$0.82	$1.46	$1.60
Average Daily Maximum	$2.50	$4.47	$4.34

1972 Averages for all facilities from Wilbur Smith & Associates Study, 1974, p. 120.

5. Usage

Unfortunately, there is little recent data available on parking facility utilization which is felt to be reliable, and is directly comparable to previous surveys. Table 15 shows parking utilization with respect to capacity for the years 1978 and 1980. 10:00 A.M. occupancy is used as the demarcation time between commuter and other uses. In five of the six facilities, the June, 1980, one-day 10:00 A.M. occupancy was less, in several cases substantially less, than similar surveys taken in June, 1978. It is the feeling of the Real Property Department, the owner of the City garages, that usage has decreased in recent years, although there is no data available which substantiates this. Similarly, it has been estimated by a private operator that there has been a decrease in usage at private facilities of about 8-10% over the last few years.

D. Summary - Parking

This survey of existing parking facilities and recent trends in parking supply lead to some observations regarding parking conditions in the past and in the future. These are:

- On-street parking is the most convenient form of parking, yet remains underpriced relative to off-street facilities.

- On-street parking enforcement and follow-up is not near what it could and should be. Efforts are currently being made to remedy the acknowledged poor situation through contracting out the collection process.

- The total downtown parking supply has tightened over the last decade. Concurrent with the imposition of the Freeze on commercial off-street parking in Boston was a reduction in on-street spaces, thus making curb-side spaces in residential areas all the more scarce and desirable. This has intensified the need for resident-only parking in neighborhoods adjacent to the CBD.

- The price of on-street parking in the vicinity of the Downtown Crossing has increased at a rate greater than the general rate of inflation, since 1972, whereas throughout Boston Proper, average prices have just about kept pace with inflation.

- The ratio of the one-hour rate to the daily maximum rate has dropped since 1972. This means that now, the maximum parking rate is reached in 2 3/4 hours, providing little incentive for turnover after that amount of time has passed.

- The number of parking spaces open to the public has remained constant, as dictated by the Freeze, but restricted spaces have increased by 3,000 since the establishment of the Freeze.

- The total number of parking facilities has decreased whereas the amount of spaces has remained constant, in the case of public usage, or increased, in restricted facilties, indicating a shift toward fewer, but larger, facilities.

TABLE 15

Comparison between Selected Facilities, 1978 and 1980

One-Day Counts

		1978		1980	
	Capacity	10:00 A.M. Occupancy	%	10:00 A.M. Occupancy	%
Woolworth's	900	1073	119	615	68
Province St. Garage	290	135	47	79	27
Beach St.-Shoppers' Garage	500	308	62	188	38
Pi Alley	600	394	66	312	52
Kingston/Bedford	735	188	26	154	21
Quincy Market Lot	204	110	54	174	85
TOTAL	3229	2208	68%	1552	47

- There has been a significant rise in the number of garages, as more parking is incorporated in, or associated with new development, rather than in unattached surface parking.

In summary, the Parking Freeze has achieved its objective of restraining the growth in commercial parking spaces, and has exerted influence over the design and location of new commercial parking.

IV. PARKING AND DOWNTOWN DEVELOPMENT

A. Introduction

One of the most important issues regarding parking and downtown development is that of striking a balance between the parking needs of commercial, office and industrial concerns, and the environmental, aesthetic and economic problems caused by the numbers of automobiles converging on the Downtown. The Parking Freeze has been instituted as one partial solution to the situation. Yet there remain questions on both sides of the issue - has the Parking Freeze hindered development by placing constraints on the number of spaces really required for Downtown development to be competitive? Does the restriction also harm existing businesses by making it more difficult for customers, clients and employees to get downtown, perhaps discouraging discretionary trips? Has the Parking Freeze achieved its objective of restraining Vehicle Miles Travelled and ameliorating Downtown congestion and air quality? Or has not sufficient time passed to make a conclusive judgement?

This chapter, and those succeeding, will attempt to answer these questions. The end result will be recommendations regarding the Parking Freeze and other parking management strategies.

The location and level of development are based on many factors. Some of the more general factors are the health of the national, regional and local economy and prevailing interest rates. More location-specific factors include the composition and availability of the local labor force; development costs such as land acquisition, site preparation, construction and local regulations which can add costs and time to development; willingness of the municipality to facilitate development, prevailing rents, vacancy rates and amenities. The particular needs of an industry or business also shape expansion or location decisions, such as advantages of proximity to allied businesses, or to institutions such as the courts. Accessibility of employees, clients and customers also is a consideration, but it is one of many involved in the array of decision variables.

How important is accessibility? More specifically, how important is parking and automobile accessibility for office employees and shoppers? What part does parking play in development decisions?

These questions will be addressed through an examination of development and retail trends, commuting patterns and case studies of recent development projects in Downtown Boston in order to assess the impacts of the parking controls and suggest directions for the future.

B. Economic Trends in Boston - 1970-1980

1. Employment and Population

Table 16 shows recent employment and population figures for the City and metropolitan area. Between 1970 and 1980 population in the City declined by 14%, although residency in Boston Proper increased by almost 7,000. The metropolitan area population has declined slightly between 1970 and 1980.

TABLE 16

BOSTON ECONOMIC TRENDS AND PROJECTIONS
DOWNTOWN, CITY AND METROPOLITAN AREA

Population

Year	Boston Proper	City of Boston	Metropolitan Area
1970	65,857	641,071	3,014,000
1975	69,255	637,986	2,950,000
1980	72,654	562,990	2,885,000

Employment*

Year	Downtown	City of Boston	Metropolitan Area
1970	256,000	551,000	1,435,000
1975	270,000	504,000	1,397,000
1980	290,000	540,000	1,553,000
1985 Projected	320,000	585,000	1,668,000
1990 Projected	342,000	620,000	1,779,000

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*Not exact numbers due to rounding.

Source: Boston Redevelopment Authority, Research Department from Boston - A Special City; Boston's Economic Transformation: and Boston's Population and Housing to 1990.

Employment City-wide has shown a net decrease over the past decade. The 551,000 persons employed in Boston in 1970 fell to 504,000 in 1975, but climbed to 540,000 in 1980. Projections show further growth in the next decade, up to 620,000 by 1990.

By contrast, Downtown employment has exhibited continuous growth since 1960. Between 1960 and 1970, employment increased by 8%, and then by 5% in the following five years. This growth continued in the last part of the seventies, rising by 20,000, or 7%, and in the next 5-year period, is projected to grow a further 10%.[9]

Services account for three-quarters of all downtown jobs, and this sector is expected to absorb most of the projected growth in employment. In 1980 it is estimated that there are 185,000 downtown office workers, 22,000 retail, 23,000 institutional, and 59,000 workers in manufacturing, hotel and other industries. Clearly, office workers are the most significant group of employees in the Downtown, and are expected to retain their proportion of downtown employment in the coming decade.

Because of the dominance of office workers in the Downtown, and their commuting patterns which occur most often in the peak-hours, as opposed to many manufacturing and retail employees, office workers will be the focus of the examination of downtown employee commuting patterns.

2. Office Development

Over two million square feet of new and rehabilitated office space has been developed over the past five years. This growth is not as rapid as that experienced between 1971 and 1976, but it is nonetheless substantial, and prospects for its continuation are excellent. Currently under construction are five million square feet of new office space, and almost a million square feet of rehabilitated office space (see Table 17 and Appendix D). A further two million square feet of new or rehabilitated space are in the planning stage, to be completed before 1990.

3. Retail Sales

Retail sales in Downtown Boston were in a steady decline from the 1950's through the mid-seventies. Recent data for the CBD and Back Bay show slight gains for both the areas of about 3-4% in constant dollars between 1977 and 1979.[10]

Downtown Crossing expenditures have increased during the weekdays by 43% between 1978 and 1980, far exceeding the inflation rate of 22%.[11]

Downtown retail employment has also shown slight increases in recent years in reaction to the improvement of the retail climate in the Downtown.

4. Manufacturing Employment

Manufacturing employment in the Downtown has steadily declined since the fifties until recently. Manufacturing employment, over 100,000 in 1950, fell to a low of 50,000 in 1975, but gained about 3,500 between

DOWNTOWN BOSTON OFFICE SPACE INVENTORY, 1960-1980

In Square Feet of Floor Area

Year	Private Office Stock	Change in Millions	Public Office Stock	Change in Millions	Total Office	Change in Millions
1960	22,000,000		2,100,000		24,100,000	
		1.9		2.5		4.4
1965	23,900,000		4,600,000		28,500,000	
		3.4		--		3.4
1970	27,300,000		4,600,000		31,900,000	
		9.3		0.6		9.9
1975	36,600,000		5,200,000		41,800,000	
		1.8		1.0		2.8
1980 (est.)	38,400,000		6,200,000		44,600,000	

Boston Redevelopment Authority Research Department, 1980

1975-1980. Yet it remains a small percentage of total Downtown employment, although efforts are being made to attract more manufacturing employment.

C. Office Workers - Getting to Work

Employees who commute to work by automobile are specifically the group of travellers that City parking policy aims to discourage. These commuters make their trips in and out of the City at roughly the same time, causing "peak-period" congestion, and air pollution "hotspots"; travel alone, more often than not, using highway space less efficiently than shoppers or visitors, who tend to have higher automobile occupancies; and whose travel time coincides with the most frequent transit service, making it easier to use transit than mid-day core-bound travellers.

Prior parking management programs, targeted toward employees, have not had much success in modifying travel patterns. The 25% reduction in employee spaces, mandated by EPA in 1973, later changed to single passenger commuting vehicles, did have some effect at the time, but there was no follow-through or enforcement. It was even stated in the directives that no enforcement would result from non-compliance if a "good faith, diligent and expeditious effort" was made to encourage the use of carpools and mass transit.

Some companies, notably several large insurance companies, did establish carpool/vanpool programs with varying degrees of commitment and success. Transit passes first became available at large employers, although now they can be purchased in many locations. Subsidized transit passes are offered by a few offices. It is estimated that 60,000 MBTA passes were purchased each month in 1980 through the employer pass program.

1. Mode of Commute

Several different sources of data are available on office employee commuting. The most up-to-date is the Downtown Crossing Office Employee survey, which in the summers of 1978 and 1980, surveyed 39 office buildings in the vicinity of Downtown Crossing with a combined number of employees exceeding 61,000. The BRA conducted an Office Tenant Survey in 1977 which sampled tenants in a variety of buildings in every section of Boston Proper, and one question was mode of access to work. The findings are found in Table 18 which show a decrease in automobile usage and a corresponding increase in transit use within the last several years.

This decline in auto usage for work trips is not discernable through available traffic data (Chapter II) but is validated by the decrease in parking facility utilization noted in Chapter III. No data is available which permits comparisions to be made for worktrip auto-occupancy over the last several years, but it is reasonable to assume that carpooling has also increased over the past several years.

2. Destination of Commuters

The buildings surveyed for the Downtown Crossing survey were generally located within a couple of blocks of the transit "square" -- where all of

TABLE 18

Mode to Work of Employees of Selected Buildings in Boston Proper

Mode	Percentage of Responses BRA 1977 Office Survey	 1978 Downtown Crossing Survey	 1980 Downtown Crossing Survey
Car/Taxi	31%	24%	17%
Sometimes Car, Sometimes MBTA	3%	NA	NA
Drive to MBTA	3%	6%	7%
Subway/MBTA Bus	50%	48%	53%
Commuter Rail Alone	2%	10%	10%
Commuter Rail/ Subway/Bus	NA	1%	1%
Private Bus	7%	5%	5%
Walk/Bike	4%	6%	7%

the rapid transit lines converge on Downtown, whereas the BRA tenant survey was conducted in a wider area. Aside from changes over time, it would be expected that areas outside of the immediate Downtown, areas served less well by transit, would have higher rates of auto use.

This is confirmed in Table 19, as there are differences in commuting patterns based on destinations within Boston Proper. Automobile usage rates are similar in the Financial District, Government Center and Midtown--areas with superior transit service to the Back Bay. Transit usage and park/ride rates are correspondingly lower in the Back Bay, but its location offers more opportunities for walking to work.

3. Origin of Commuters

Approximately 25% of all office workers employed in Downtown Boston are residents of the City. This proportion, derived from 1980 data, was exactly the same percentage found in the 1977 BRA Office Tenant Survey. As expected, a low percentage of Boston residents commutes to work via auto, as shown in Table 20 and a surprisingly large percentage of these workers walk to work - 23%. This number seems rather high, and there may be some bias in the survey respondents which contributes to this. But it is clear that there are now significant numbers of Boston residents who walk to work. There are over 70,000 persons who reside in Boston Proper, and in addition to Charlestown residents, provide a large pool of residents who live within a comfortable walking distance of Downtown.

The remainder of the metropolitan region has been divided into sectors, as seen in Figure 7, and mode of commute for core-bound employees living in these corridors displayed in Table 20. Auto usage generally increases with distance from the core, although it is not a perfect correlation. For example, in the southern corridor, 24% of those within Route 128 commute by auto, dropping to 20% for communities within 15 miles, but rises again for communities within 20 and 25 miles, respectively.

Massachusetts Turnpike communities have somewhat higher auto usage rates than other corridors. Relatively less congested roadway conditions, higher incomes of the western corridor, and problems with Green Line service are factors which contribute to high auto usage in this area.

The Northern communities, clustered around I-93, have quite high transit usage rates. MBTA usage includes commuter rail, and the traditionally strong commuter rail patronage in that corridor coupled with good Orange Line service with adequate parking, leads to 80% transit mode split with a radius of 15 miles.

The data contain some anomalies, such as 8% cycle (both bicycle and motorcycle) in the southern corridor within a radius of 25 miles, but on the whole, gives a plausible picture of modal split by home zone.

4. Other Characteristics of Commuters

Tables 21 and 22 display mode of access by household income and occupation for 1980. As expected, auto usage increases with income, jumping sharply for those with income of over $30,000. In Table 22, it can be

TABLE 19

Commuting Modes by District of Employment

	Financial District	Government Center	Midtown	Back Bay
Automobile	32%	30%	33%	40%
MBTA	56%	54%	53%	46%
Private Transit	5%	10%	5%	7%
Park/Ride	3%	3%	5%	1%
Walk/Bike	4%	3%	4%	6%

Source: Boston Redevelopment Authority, Office Tenant Survey, 1977

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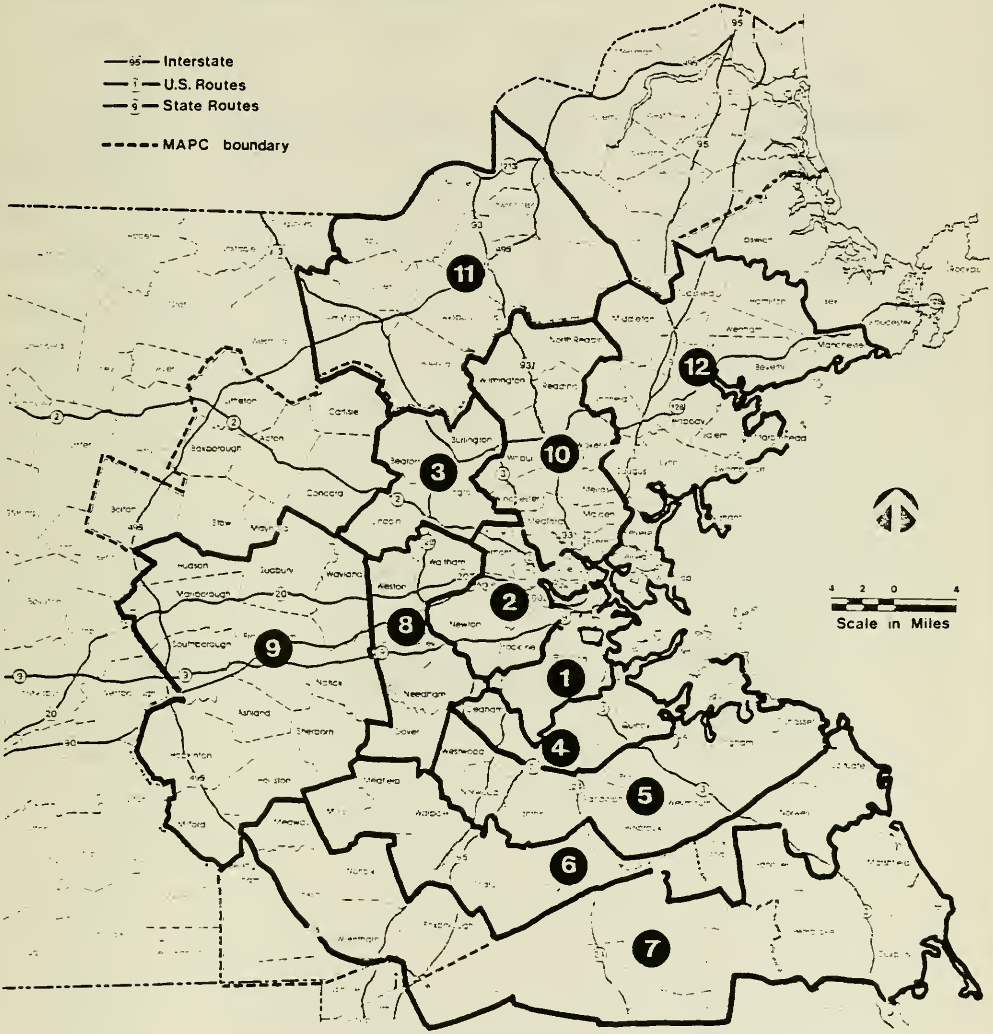
TABLE 20

MODE OF ACCESS BY HOME ZONE

	Communities	Walk	Auto	MBTA	Private Bus	Park/ Ride	Cycle	TOTAL	% of Workers Surveyed
1.	Boston	23%	13%	60%	--	3%	1%	100%	25.7%
2.	Inner Suburbs	1%	16%	76%	--	5%	2%	100%	16.8%
3.	Northwest	--	26%	49%	19%	6%	--	100%	2.0%
4.	South within 128	--	24%	71%	1%	4%	--	100%	6.5%
5.	South within 15 Miles	1%	20%	60%	7%	9%	3%	100%	7.2%
6.	South within 20 Miles	--	25%	51%	14%	8%	2%	100%	4.1%
7.	South within 25 Miles	--	26%	26%	32%	8%	8%	100%	2.6%
8.	Mass. Pike within 15 Miles	--	29%	66%	2%	3%	--	100%	4.1%
9.	Mass. Pike within 25 Miles	--	35%	38%	20%	6%	1%	100%	2.7%
10.	I-93 within 15 Miles	1%	17%	72%	1%	8%	1%	100%	12.3%
11.	I-93 within 25 Miles	--	17%	40%	27%	14%	2%	100%	1.4%
12.	North Shore	1%	18%	71%	2%	8%	--	100%	10.2%
	Other	2%	27%	55%	8%	8%	--	100%	4.4%
									100.0%

FIGURE 7



HOME ZONES

COMMUTING MODE BY HOUSEHOLD INCOME

	Household Income (in thousands)				
	0-6	6-12	12-18	18-30	30+
Auto	9%	9%	18%	19%	30%
MBTA	73%	73%	63%	61%	48%
Park/Ride	4%	5%	4%	7%	7%
Private Transit	5%	3%	5%	6%	7%
Walk/Bike	9%	10%	10%	7%	8%

Downtown Crossing Office Building Employee
Survey, 1980

TABLE 22

COMMUTING MODE BY OCCUPATION

	Occupation					
Mode	Sales	Clerical	Exec. Prof.	Factory	Crafts	Other
Auto/Taxi	39%	17%	24%	15%	24%	19%
MBTA	46%	66%	54%	75%	56%	60%
Park/Ride	3%	7%	5%	10%	9%	7%
Private Transit	5%	5%	6%	--	1%	9%
Walk/Bike	7%	5%	11%	--	10%	5%

Downtown Crossing Office Building Employee Survey, 1980 seen that executive and professional employees have a mode split to auto of 24%, whereas for sales employees, the figure is 39%. This probably cannot be explained on the basis of income alone, but is due in part, to working hours which may fall outside the peak-transit service times, and the inclusion of non-retail sales personnel in the surveyed buildings who require automobiles to call on clients.

D. Role of Parking in Development

Clearly, it is difficult to isolate any negative impact the Parking Freeze has had on Downtown development, since employment in the Downtown has continued to increase since the Freeze implementation. However, it is possible to examine the role that parking plays in location decisions and the effect the Parking Freeze has had on specific developments. Case studies of three developments and other available data on parking and development will elucidate some of the impact that the Freeze has had on recent projects.

1. Importance of Accessibility to Current Office Tenants

The BRA Office Tenant Survey of Downtown firms asked if the offices had any plans to move. About 1/4 of the businesses surveyed were considering moving their location of business. Not one reported that they would move to improve access to transit, but 15% replied that improved auto access was a factor in their plans to move, and 13% cited improved parking as a consideration. Lower costs and more space were listed much more frequently as reasons for a move.

Over one-third of all respondents (including those not moving) felt that proximity to transit was an important locational factor, whereas only 14% and 18% respectively, felt that parking and auto access were important locational factors.

It is significant that managers of firms see proximity to transit as a more important locational factor than parking or auto access. This reflects a recognition that in order to maintain and attract lower- and moderately-paid personnel, it is an advantage to be located near to transit.

In conversation with developers and Downtown office managers, it was emphasized that some parking is crucial in attracting tenants. This development-related parking is generally reserved for managers, those persons who also make the decision regarding where to locate their office. Also, confirmed by the data in Table 22, businesses with sales people "on the road" who need to check in and out of the home office every so often also regard reserved parking as necessary.

However, there is evidence of a change in the perception of the necessary threshold of parking associated with Downtown developments over the last several years. This change has come about because of economics, prior successes in developments with little or no parking, the zoning code and Parking Freeze.

2. Recent Office Development and Current Parking Criteria

New office construction, as mentioned beforehand, has been proceding at a healthy pace over the last decade. A listing of those new buildings which are larger then 100,000 square feet, contain some office space and have been built since 1968, are found in Table 23.

Employee parking spaces (those which are not open to the public) and public spaces are also noted in the table. An examination of parking spaces per 1,000 square feet of leasable space shows a few very high values, and the remaining, for the most part, falling within a narrow range. The Charles River Plaza, built in 1968 which has the greatest ratio of spaces to square footage contains a large grocery store, in addition to a cinema and other retail uses. Even so, the total parking spaces provided are far above any other development which followed.

Although the Parking Freeze was instituted by EPA in 1973, the actual Freeze administration mechanism was not fully operational until 1976. Thus, the first new building that applied for a Freeze Permit or exemption was 60 State Street, opened in 1977. Looking at parking before and after that time, it appears that parking provided in buildings opened prior to 1977 display a wide variation, including little or no parking. One factor which may have contributed to no or low parking in several large buildings is the zoning code revisions of 1973 which specify that non-residential parking was to be a Conditional Use within Boston Proper after 1973, and even prior to that, non-residential parking was a Conditional Use in some Downtown districts. However, wide variations were still permitted, as seen in the over 1,700 parking spaces associated with the Hancock Building, established just prior to the Freeze.

Since the Freeze has been put into effect, the average number of spaces associated with developments has fallen due to the uniformly moderate numbers of spaces now provided. There are no longer extremely high values, and the proportion of parking supplied per square foot values now fall within a narrow range. Copley Place, a mixed-use project under construction which has the largest supply of parking among newer buildings, contains a significant retail component. For purely office buildings, then, the proportion of parking contained in the development ranges from .46 (all public spaces) to none.

These values are low when compared with other cities. However, if one assumes that there are approximately 5 employees per 1,000 square feet, but only .40 spaces per 1,000 square feet, that translates to .08 spaces per employee, or one space per every 12.5 employees. This proportion, at the higher end of the scale, indicates that parking contained in the development is less than the mode split to auto is now among office workers, so there is definitely overflow to detached parking facilities.

The very low amount of parking supplied in two developments of over a million square feet, Dewey Square (Rose Towers) and Exchange Place, results in about one space for 50 employees, indicating the spaces are reserved for executives or "special needs" employees only.

DOWNTOWN OFFICE CONSTRUCTION
1968-1980

TABLE 23

(Buildings over 100,000 Sq. Ft.)

Address	Built	Gross Leasable Space in Sq. Ft.	Employee Parking Spaces	Public Parking Spaces	Total Parking Spaces	Spaces per 1,000 Sq. Ft.
Charles River Plaza	1968	180,000*	100	794	954	5.3
New England Merchants	1968	590,000	--	--	--	--
Center Plaza	1968	680,000*	--	580	580	.85
Prudential	1971	2,000,000*	--	2,067	2,067	1.03
First National Bank	1971	1,175,000	174	--	174	.15
Keystone	1971	775,000	163	--	163	.21
One Washington Mall	1972	140,000	--	--	--	--
One Beacon Street	1973	1,020,000	150	--	150	.15
30 Winter Street	1974	105,000	--	--	--	--
100 Summer Street	1975	1,000,000	--	--	--	--
50 Staniford Street	1975	200,000	--	--	--	--
One Federal Street	1975	1,103,000	240	--	240	.22
Hancock Place (Hancock Tower)	1975	2,000,000	1,010	774	1,784	.89
245 Summer Street	1975	910,000	--	--	--	--
55 Summer Street	1976	140,000	--	--	--	--
Federal Reserve	1976	1,138,500	--	--	--	--
60 State Street	1977	700,000	227	--	227	.32
175 Federal Street	1977	200,000	--	--	--	--
One Post Office Square	(1981)	750,000	218	82	300	.40
Copley Place	(1984)	1,300,000*	--	860	860	.66
Dewey Square	(1982)	1,100,000	120	--	120	.11
Exchange Place (53 State Street)	(1983)	1,160,000	93	--	93	.08
50 Milk Street	(1981)	250,000	99	--	99	.40
State Transportation Bldg.	(1982)	600,000	--	275	275	.46

*Mixed Use - Retail and Office

In conclusion, there has been a decrease in the number of office development-associated spaces supplied since the Freeze has been in effect. However, the relation is not clear-cut. There were large buildings constructed without parking prior to the Freeze, and there are yet buildings constructed with as many as .4 spaces per 1,000. It should be recalled that the Freeze applies only to spaces open to the public, not restricted spaces.

3. Employee Parking

Exemptions from the Freeze are given for four categories of parking: employee, hotel guests, residents and customer/visitor. Exemptions given since 1973 are shown in Table 24. Under the zoning code, hotels are considered to be a Residential Use, and similarly, hotel parking can be considered as Residential Use. Residential parking is differentiated from other parking, particularly in the Downtown, because it does not encourage peak-period auto use, and supports downtown residency, which generally obviates the need for an automobile for work and shopping.

Designated customer and visitor parking represents a small percentage of the available parking in Boston Proper - 6%, and has only increased by 30 spaces since 1973, and therefore, is a minor portion of the parking supply in Boston. (Refer back to Table 8 for the breakdown of restricted spaces).

Employee spaces comprise two-thirds of the restricted spaces, and 25% of all spaces in Boston Proper. Again, this is the category of restricted spaces which presents the biggest challenge to parking policy since these spaces are primarily provided free of charge to employees who travel during the peak-hours. From the data available, it appears that only 1,161 of the over 13,000 employees spaces have hourly or daily fees, although some employees undoubtedly pay monthly charges, not reflected in the data.

Free employee parking can be viewed as a fringe benefit to the employee, a perquisite which has the effect of providing an incentive to use the automobile for access to Downtown. It is also a fringe benefit which is not subject to taxation, which is part of its appeal.

A recent study entitled: "Employer Subsidized Parking and Travel Mode Choice"[12] brought out the following points about employee parking:

- Parking subsidies to employees in the aggregate are inequitable because employers thus substantially reduce the cost of auto commuting, but do not generally offer an equivalent price reduction for travel to work by carpool or public transit.

- Since employer-subsidized parking is a non-taxable fringe benefit, its after-tax value to an individual rises as the taxable income and marginal tax rate of a parker increases.

- "The distorted incentive to drive increases not only traffic congestion, but also air pollution and energy consumption so that harmful effects of free parking extend well outside the transportation sector."[13]

TABLE 24

EXEMPTIONS GIVEN SINCE 1973
CATEGORY OF SPACES

1977-1980

Employees	Hotel Guests**	Residents	Customers/ Visitors
227 - 60 State St.	81 - Ritz-Carlton	50 - 178 Newbury St.	30 - 34 Cooper
*99 - 50 Milk St.	*190 - Long Wharf	50 - Ritz-Carlton	
*93 - 53 State-Exchange	*80 - Armory	210 - Greenhouse	
*218 - Post Office Square	*265 - Dalton Street Hotel	6 - Lavendar Trust	
	*527 - Copley (2 garages)	55 - Viviendas	
	*100 - Post Office Square	18 - 77 Salem Street	
		45 - Copley Place	
		20 - 330 Commonwealth Avenue	
		*230 - Devonshire Towers	
TOTAL:			
637	1243	684	30

1973-1976

Employees	Hotel Guests**	Residents	Customers/ Visitors
240 - One Federal Street Shawmut Bank (1974)		710 - Charles River Park	
1010 - Hancock St. (1975)		110 - Fulton-Richmond (1963)	
58 - Tremont-Berkeley Police Dept. (1974)		60 - Mass. Pike Towers	
174 - First National Bank		107 - 130 Bowdoin St. Boston View Corp.	
75 - Addition to DPW Lot			
TOTAL:			
1557		987	

*Under construction as of December, 1980.
**Considered as "residential" spaces.

- It is estimated that "20% of commuters who now drive alone and park free would choose another travel mode if they were required to pay for the parking they now receive at no charge. The nation will obviously never meet its proclaimed goals of energy conservation, environmental protection and transportation efficiency if so much parking remains free."[14]

The authors suggest two strategies which will reduce subsidized employee parking. The first is for the Federal Government to adopt a tax-exempt travel allowance, a complicated scheme which basically removes parking subsidies and allows companies to classify part of each employee's wage as tax-exempt. The second, more practical recommendation, is that by encouraging carpooling, companies could expand benefits to more employees without incurring any additonal costs to themselves.

4. Recommendations

Carpooling is a good technique for using the existing highway system more efficiently and can reduce auto volumes. Encouragment of carpools should be imposed in new employee parking situations (see Chapter VII), but would be most successful if applied to already existing employee parking. At the present time, the City does not have any means to exert leverage to encourage carpooling in "old" facilities, nor does it attempt to influence its own employees in this direction.

One suggestion which would impose higher costs on employers which hopefully would be passed on to employees, would be to extend the proposed City parking excise tax to restricted spaces. At present, as proposed, the parking tax of 15% to 20% applies only to commercial spaces, but it is suggested that a flat tax be administered to all non-residential restricted spaces. Ideally, this tax would be set so it is higher than 15% or 20% (depending on the ultimately approved value) of the average daily maximum rate of parking facilities in either all of Boston Proper, or that prevailing in the vicinity of the facility in question. This would be a first step in raising the cost of parking to whose who pay little or no cost for their use of City streets at peak-hours. There are some legal questions about the application of this tax, which are, at present, being investigated.

E. Case Studies - Three Developments

Three current developments were chosen as case studies in order to determine if there are small-scale impacts of the Parking Freeze which would not be captured in an overall analysis. These three represent a cross-section of developments, including substantial retail, primarily office, and office-hotel. They are: Copley Place, One Post Office Square and 53 State (Exchange Place).

1. Copley Place

This 1.3 million square foot project, developed by Urban Investment Development Corporation (UIDC) is located in the Back Bay, 700,000 square feet are devoted to office, 370,930 to retail, 100 residential units and two hotels, with a combined total of 1,790 rooms.

The plan to develop Copley Place first emerged in 1977. Since then, there has been numerous changes in design and the mix of uses. UIDC originally applied to the APCC for 1,400 total spaces, later amended to 1,821. This total originally included 500 employee spaces. The traffic consultant stated that actally 800 employee spaces were necessary, and that the 500 to be provided were "below all estimates of needed demand." The Commisson still felt that 0.78 spaces per 1,000 square feet of office space was too high, and pointed out that recently constructed comparable office buildings had lower ratios of parking to square footage (see Table 23). It was UIDC's position that "cutting employee spaces would put UIDC at a competitive disadvantage", and emphasized that employee parking is very critical in order to attract tenants, despite the proximity of the new Back Bay Orange Line and Commuter Rail station.

The Commission would not allow UIDC to increase its commercial parking spaces. The developer felt that the large, up-scale retail store that was coming into the development definitely required a certain level of parking in order to be viable, a level of commercial parking which could not be provided for under their allotted spaces. Consequently, the developer decided to completely forego employee parking, in favor of an increased number of commercial spaces.

As the current plan now stands, the office square footage has increased from 640,000 to 700,000, and there will be no employee spaces provided. 860 spaces will be open to the public, and over 500 spaces will be designated for hotel guests. Planned overall parking has decreased from 1,821 to 1,432.

It is fairly certain that if the APCC had not intervened, there would have been more parking associated with the development, and in particular, employee spaces. In this case, where there was a choice between employee parking and commercial parking, it was determined that employee parking was expendable, an the provision of retail support parking was critical to the success of the project.

2. One Post Office Square

One Post Office Square, located in the Financial District, contains a mix of office and hotel space. The Beacon Companies, project developer, originally planned 400 total spaces to consist of 200 commercial and 200 employee/hotel guests (exempt from Freeze). At the time the application for 200 spaces was made to the Commission, there were only 93 spaces in the Bank, so there was no possibility of acquiring the originally-sought amount, unless the Developer desired to return to the Commission at a later date. The Commission stated that they would prefer to see a reduction in employee spaces, if an increase in commercial spaces was to be permitted.

The Developer was given a Freeze permit for 82 spaces, with the possibility that at a later date, more spaces may be allotted. However, the Developer chose to convert the remainder of the requested Freeze spaces into employee spaces, over which the Commission had no jurisdiction. Again, commercial spaces are preferable, from the City's viewpoint, to employee-designated spaces, because of the economic restraint on parkers, but in this instance, the ratio of employee-commercial spaces to square footage is still rather low.

This case demonstrates the difficulties that are entailed by the exclusion of employee spaces from the Freeze. The Commission was not able to restrict the number of employee spaces, nor supply the project with the desired commercial spaces. Commercial spaces were traded for employee spaces, in contravention of the City's objectives.

3. 53 State Street - (Exchange Place)

This development, located between Government Center and the Financial District will contain over one million square feet of office space, presently under construction. The design of the building includes the incorporation of the old Exchange Building within it. The old structure housed a garage consisting of 99 spaces, and the developers included this number of spaces in their plans for employee parking. Because no Freeze spaces were requested, the Commission made no allocation. It did, however, issue an exemption limited to employees and tenants.

The ratio of spaces per 1,000 square feet is under .09, a relatively low number, and it should be noted that this type of ratio usually indicates exclusive VIP parking.

4. Overview

These three cases illustrates ways in which the Commission can and cannot affect the parking supply. Follow-up conversations were conducted with representatives of the developing company. None of these officials felt that the Freeze in any way influenced their decision to build or not build. It was strongly stated, however, that in order to attract a certain clientele, such as professionals, that some reserved parking was necessary in order to successfully compete with suburban locations. Also emphasized was the point that when relatively few parking spaces are provided, these spaces are allocated to VIP's. These people, it was noted, often make the decision where to locate their offices. Further, these individuals do not add to peak-hour congestion since their working hours are apt to be longer than normal, and thus their travel times fall outside of the peak-hours.

It was felt that any additional restriction on developers, such as inclusion of employee space under the Freeze, would result in detrimental impacts on Downtown development. Developers, they said, are aware of the rising costs of parking construction, and only include enough parking in order to make their project attractive.

None of the persons spoken to reported that they could point to any negative impacts that the Freeze had on their development. For Copley, they would had liked to have more parking, but the Freeze did not influence the tenant mix or the scale of the development.

Copley is just now starting to rent office space, and has not as yet, determined if the lack of employee parking is going to have a detrimental impact on their leasing. Post Office Square and Exchange Place are well along in their leasing, and state that parking is almost always requested, although it was unclear if unavailability of spaces was a major deterrent in the decision to lease. Both reportedly are doing well in their leasing efforts.

In summary, the Freeze and the issue of employee parking, although important, did not have a negative effect on the development of these major projects.

F. Summary

From all available macroscale and microscale data, retail and office development does not exhibit any signs of being deterred since the Freeze has been put into effect. The rapid growth in office employment and development in the early seventies has been slightly moderated, but nevertheless significant in the last half of the decade. The national recession that occurred in that time period most likely was the major cause of a slight downturn in office development, since office buildings under construction or in the planning stages now represent a continuation of the healthy state of development activity. Further, the Parking Freeze does not appear to have a major impact on the development process. The Parking Freeze has prevented the demolition of older buildings for the construction of parking lots, thereby making available lower cost office and retail space.

Retail sales have only recently reversed their downward trend starting in the fifties, and the future outlook is optimistic as Lafayette Place and Copley Place come on-line.

Employment in the Downtown is up, and will increase in the next five years as new hotels, offices and industries are completed. Parking usage data does not substantiate the view that there are difficulties in finding parking in some locations, either in the morning or during the day. Since overall Downtown activity is increasing, the decrease in auto access to the Downtown may be the result of the tightening of the parking supply in some locations, rising fuel costs and carpooling. Data indicates that those who do drive Downtown to work tend to be higher income employees, those who may need their automobiles during work hours, and tend to live further away from their workplace.

From all available data, it appears that the Parking Freeze has achieved its objectives of restraining auto usage, yet not impeding Downtown development activity.

Growth in employee spaces, however, has continued to occur. Although the number of employee spaces provided in new development has moderated, the increase in these spaces is a matter of concern. It is recommended that the feasibility and legality of imposing a tax on these spaces be investigated, and other measures to restrict their further growth be pursued.

V. CITY PARKING ISSUES AND POLICIES

A. Introduction

The City of Boston has specific interests in regard to parking which are not necessarily shared by the region or EPA, and sometimes can be contradictory to its own transportation policies.

The City desires to manage automobile access to Downtown for several reasons. Reducing congestion and improving air quality are goals shared by EPA, while the City also wishes to maximize productive land uses and reduce parking "blight". Another detrimental aspect of automobile commuting, as far as the City is concerned, is that much of the corebound traffic travels through residential neighborhoods, degrading the neighborhood environment and adding to safety problems. Many neighborhoods are further impacted by non-residential on-street parking. Also, the City is one of the few places which offer an alternative to an automobile-dominated lifestyle. For these reasons and more, it is the City's policy to encourage transit ridership, still recognizing that a certain level of auto access is necessary.

However, the City also has a compelling financial interest in parking and transportation policy. Higher transit patronage helps to defray the sizeable MBTA deficit which adds to City property tax assessments. Stricter on-street parking enforcement and collection has been identified as another revenue source, which would have the additional benefits of inducing longer-term parkers to use off-street facilities, freeing curb spaces for short-term users. The City is presently looking into the possibility of a 15-20% tax of parking receipts as another source of revenue, under the premise that the majority of parkers are suburbanites and should contribute toward the costs of maintenance of City streets and allied services provided to them, currently at no cost.

Finally, as the owner of about 20% of the commercial parking spaces in Boston, the City desires to maximize revenue from its property. However, in order to do so, the City does not necessarily require its lessees to operate in a manner consistent with its own parking and transportation policies. Particularly in the case of Post Office Square and Winthrop Square garages (2,075 spaces), the City may not require desired changes due to 40 years' leases into which the facilities are locked. The contradiction between the objectives of maximizing revenues and reducing long-term parking is intensified in this era of falling property tax revenues and increasing reliance on non-property tax sources of revenue.

B. Examination of City-owned Facilities

A list of City-owned parking facilities open between 1968-1980 is found in Figure 31. All of these facilities are operated by private concerns which bid for the leases through the Real Property Department. Most of the facilities are presently offered for 2-3-year leases, soon to be reduced to one-year terms and awarded to the highest bidder. It is the policy for a schedule of maximum rates to be part of the lease agreement.

City Parking Facilities - Spaces, 1968 - 1980

	Name	Type	Spaces
1.	Causeway St.	lot	122
2.	Clinton St. (closed 1977)	lot	132
3.	Dewey Square (closed 1980)	lot	170
4.	Essex/Lincoln (closed 1980)	ramp	298
5.	Fort Hill Square	mechanical	660
6.	Government Center (opened 1971)	ramp	1865
7.	Hayward Place (closed 1978)	mechanical	700
8.	Hayward Place (opened 1979)	lot	91
9.	Kilby St.	mechanical	700
10.	Kingston/Bedford	mechanical	735
11.	Nashua/Accolon Way (opened 1972)	lot	366
12.	N. Washington St.[a] (opened 1976)	lot	61
13.	Post Office Square	ramp	950
14.	Purchase/High/Atlantic	lot	70
15.	St. James Ave.	ramp	625
16.	Sullivan Square	lot	101
17.	Winthrop Square	ramp	1125

[a] night-lease only

The revenues provided to the City through the operation of its parking facilities are found in Table 26. Also seen in that table is the reduction in the number of City-owned parking spaces since the beginning of the Freeze, due to the elimination of obsolete facilities for new development. Still, the revenue provided to the City remains significant, and there is hesitation on the part of the City to jeopardize these in order to "experiment" with policies congruent with parking and transportation objectives. Moreover, private operators, when faced with unfamiliar and potentially risky requirements such as reserving prime spaces for multiple-occupancy vehicles; restricting access to ground floor parking until after 10:00 A.M. (thereby setting aside the most convenient spaces for short-term parkers); and charging flat rates with a high daily maximum, may submit lower bids than would otherwise be the case.

Referring to Figure 13, rates at City-owned garages tend to be lower than rates at private facilities and, as seen in Table 27, have not kept pace with inflation, in several cases. This is due to the fact that in the past, the City set the contractual parking rates, which were lower than those at private facilities. These low rates are maintained through clauses in the contracts, in two cases negotiated terms of forty years, permitting rates to escalate no higher than inflation. Although the City would now like to change the terms of the contract, allowing higher charges, there is no interest on the part of the lessee to do so.

The City owns three mechanical garages, Fort Hill Square, Kilby Street and Kingston/Bedford, containing over 2,000 spaces. Built during the 1950's, these are now obsolete, and repair parts are difficult to obtain. All of the mechanical garages have four or five elevators, but often one or more elevators may be inoperable. Consequently, long waits often precede ingress and egress at rush hours, discouraging patronage. Thus, these facilities are underutilized and are labor intensive (requiring employees to park cars), resulting in lower relative bids for prime parking locations.

There are indications that usage has declined over the past several years in City facilities, further giving pause to imposing more guidelines on operation.

C. Policy Options

Recognizing that the City must maintain revenues from its lots and garages, nevertheless some efforts should be made toward implementing City parking policy. As the owner of 20% of the public parking supply, the City should strive to lead the way in experimenting with innovative parking policies, and if successful, will have provided a model for the private operators to follow. These policies can be either applied singly in different facilities as they come up for bid, determined by the characteristics of each; or combined.

The options are:

1. Encourage Short-term Parking and Discourage Commuter Parking

- Daily maximums are now no longer than four times the hourly rate, and generally less. The daily maximum should be no less than four times the hourly rate and higher ratios should be encouraged.

City Parking Facilities - Spaces and Revenues

Fiscal Years - 1968 - 1981

Year	Spaces	Income
1968	6,388	$1,258,257
1969	6,388	$1,259,580
1970	6,388	$1,220,769
1971	8,253	$1,828,272
1972	8,596	$1,851,594
1973	8,596	$2,368,066
1974	8,596	$2,140,328
1975	8,596	$2,066,719
1976	8,657	$2,326,515
1977	8,657	$3,466,423
1978	8,525	$3,477,703
1979	7,916	$3,631,516
1980	7,746	$3,487,000
1981	7,448	N.A.

TABLE 27

Parking Rates at Selected City-owned Facilities, 1973 - 1980

	1973		1977		1980		1973 in 1980 Dollars	
Facility	One-Hour	Daily Max.	One-Hour	Daily Max.	One-Hour	Daily Max.	One-Hour	Daily Max.
Fort Hill Square	$ .50	$2.50	$1.10	$3.00	$1.50	$4.00	$ .85	$4.23
Government Center	$ .50	$2.00	$ .50	$2.00	$ .50	$3.25	$ .85	$3.38
Kilby Street	$ .50	$2.00	$1.10	$3.00	$2.00	$4.25	$ .85	$3.38
Kingston/ Bedford	$ .50	$2.00	$ .75	$3.00	$1.00	$4.25	$ .85	$3.38
Post Office Square	$ .75	$1.45	$ .75	$2.75	$1.50	$4.00	$1.26	$2.45
St. James Avenue	$ .60	$3.00	$1.20	$3.00	$1.00	$4.00	$1.01	$5.07
Winthrop Square	$ .50	$1.45	$ .75	$2.15	$1.50	$3.50	$ .85	$2.45

- The ground floors in facilities that have short-term usage should not be opened until 10:00 A.M.

2. Encourage Multiple-occupancy Vehicles

It is sometimes asserted that carpool programs can detract from transit patronage, and therefore, may be contradictory to the policy of encouraging transit ridership and discouraging auto access. On the other hand, increasing vehicle occupancies is one way of using the existing highway more efficiently, and can contribute toward the goal of reducing the number of vehicles on the highways.

A parking fee reduction for multiple-occupancy vehicles could be implemented, but financial considerations dictate that it could only be a marginal reduction, and would put a burden on the garage attendants to count occupants in order to administer the charges. Likewise, reserving a prime section of the garage for vehicles with three or more occupants would require attendants to direct cars to the appropriate locations and police violators. For the time being, it is recommended that neither preferential spaces or rates for carpools be implemented, pending a more detailed study of the layout of each facility and the opportunities for surveillance of entering cars into reserved multiple-occupancy sections.

3. Longer Lease Terms, Particulary in Mechancial Garages

At some point, a determination must be made on the future of the mechanical garages (see Option 4 below). However, in the short-term, longer lease terms for the mechanical garages should be provided for, since the mechanical garages are generally in a state of disrepair, and short lease periods do not provide much incentive for improvements. It is recommended that these leases be let for no shorter than a three-year period, and preferably, five years.

For other facilities, a longer lease period is less imperative, but terms of less than two years do not encourage the optimal facility maintenance.

4. Sale of Municipally-owned Garages

There are some who feel that the City should not be in the parking business at all, and one option is that the City should sell its parking facilities. The underutilized mechanical garages, centrally located, would be attractive to developers. Much-needed revenue from taxes on "higher uses" would result.

VI. ANALYSIS OF WHAT MIGHT HAVE OCCURRED IN THE ABSENCE OF THE PARKING FREEZE

The most striking, yet elusive impacts of the Parking Freeze are what would have occurred had it not been implemented.

Because of the complex nature and the number of variables which influence transportation, air quality and development, it is difficult to isolate the effect of the Parking Freeze on these urban elements. As aforementioned, development does not seem to have been affected either way by the Parking Freeze. For the subjects of transportation and air quality, the approach used here will be to hypothesize what might have occurred without the Parking Freeze, and make comparisons to the conditions at present. To begin, the impact that the Freeze has had on the parking supply (where the most clear-cut relationship exists) will be examined, and then expanded to include transportation and air quality impacts.

A. Parking

The 1972 Wilbur Smith study made forecasts of growth in parking spaces based on three scenarios. The assumptions contained throughout were that there would be a growth in CBD employees of 15-16% between 1972 and 1980 (actual growth has been between 10-11%, or one-third less than forecast), that auto ownership rates would be slightly higher than in 1972, and parking rates and transit fares would rise consistent with inflation. One scenario was a freeze on parking, which is what actually occurred. The other two unconstrained estimates were:

1. Parking Increases in Accordance With Employment

It was assumed that the ratio of parking spaces per 1,000 square feet of floor area would remain constant. So as new development increases the floor area in Downtown, the parking supply would rise accordingly. This resulted in a projection that 10,000 additional spaces would be needed by 1980, and if this is reduced by one-third to account for the less than predicted growth, the number of spaces expected without restraint would be an additional 6,500-7,000.

2. Trend Projection

This projection assumes that the trend established in the 60's and 70's of increasing automobile use would continue. In order to serve this increasing demand, 14,500 additional spaces would need to be constructed by 1980; diminished by one-third, this would amount to 9,500.

Thus, these two forecasts of unconstrained growth in parking spaces, modified by the actual growth in employment between 1972 and 1980, projected an increase in the non-residential parking supply of 6,500-9,500 spaces. Therefore, it could be expected that, without the Freeze, that the number of spaces built by 1980 would fall within this range.

However, the actual net increase in non-residential spaces completed between 1973-1980 (not including those spaces under construction in 1972 such as the Hancock, the Shawmut Bank, and First National Bank, which were added to the Base number) has been under 500 (see Table 24). So for the purposes of this analysis, it will be assumed that the number of spaces not built is equal to the mean of the projected numbers of spaces, minus those actually built, or 7,500.

B. Transportation

If these new spaces were built, there would be more automobile commuters. The important question here is how many? 1980 parking capacity and usage data, found in Table 12, shows that in facilities in and around the Downtown Crossing, utilization does not exceed, on the average, 60%. However, Financial District and Back Bay parking facilities are better utilized, on the whole.

In a previous study performed for MAPC by the BRA and Boston Traffic & Parking,[15] capacity checks were made for Back Bay parking lots and garages. This one-day, informal spot check, taken at mid-day, showed there was approximately 80% utilization of spaces. A weighted average of vacancies in relation to capacity from these two surveys results in an average 70% mid-day peak-hour utilization of spaces.

It will be assumed that the parking accumulation in these unbuilt facilities would have been 70%. On one hand, it could be argued that parking utilization would fall as more spaces were built, since overall, the supply exceeds demand even now. However, there are shortages of parking in some areas of the Downtown, notably South Station, the Waterfront, and the Financial District, where current utilization is far higher than 70%, and much of the unbuilt parking supply would have appeared in those areas. Consequently, the same overall modest utilization rate of 70% will be used for the spaces not built.

Wilbur Smith found an average off-street parking accumulation of 82% and an average turnover of 1.25. Decreasing the turnover to account for 70% parking utilization, the turnover rate used here will be 1.06. This turnover rate, multiplied by 7,500 spaces, indicates that almost 8,000 cars/day do not travel into Boston, which would have, without the Freeze.

This means that 8,000 less cars per day are travelling Downtown streets. The majority (assume 80%) of these would probably be used for peak-hour travel (work trips), since that is the market for which demand most exceeds supply. Therefore, it is likely that peak-hour congestion has been ameliorated as a result of the Parking Freeze.

C. Air Quality

1. Methodology

One of the major reasons for the funding of this analysis of Downtown Boston parking programs was the expectation that an improvement in air quality would result from the restriction on the growth of parking spaces.

It will be assumed that 8,000 car/day are not coming into the City as a direct result of the Parking Freeze, and the effect on air quality and automobile emissions will be estimated. This estimate will be derived by:

- hypothesizing the origins of these 8,000 cars;
- calculating the round-trip mileage not travelled daily;
- converting these vehicle miles not travelled into vehicle emissions.

2. VMT Calculations

The distribution of origins of automobile commuters, presently employed Downtown as found in the Downtown Crossing Survey (Table 20), are assumed to be representative of those automobile commuters who are not making work trips via automobile because of parking restrictions.

Eighty-percent of the 8,000 automobiles will be assumed to have been used for work trips, and the origins and percentage representation of these foregone trips are found in Table 28. An average one-way mileage from each of these clusters of communities to a core traffic zone was obtained from the Central Transportation Planning Staff (CTPS). The product of the distance not travelled by the number of vehicles that are not making the trip Downtown is the one-way VMT saved. No data is available on the average mileage for core-bound non-work trips, but the trip length is typically less, and a one-way length of 8 miles will be assumed.

This estimate may be overstating the automobile VMT savings because travelers from more distant communities, whose opportunities for transit usage and carpooling are less available, would be more likely to continue driving than persons from nearer locations, and some of the transit users may drive to transit service (park/ride).

It is estimated by CTPS that in 1978 there were 1,974,000 VMT's[16] expended for core-bound, home-based work trips. If it is assumed that this figure has risen by 1% in both 1979 and 1980 to approximately 2,000,000, the 181,120 miles not travelled in 1980 alone represents a 9% savings in worktrip VMT. Total VMT savings are 206,730 miles. Even if this estimate was diminished by 50% to account for park/ride patrons, the annual VMT savings is still notable.

3. Impact on Automobile Emissions and Air Quality

The Metropolitan Boston region currently exceeds the national air quality standards for carbon monoxide (CO) and photochemical oxidants. Motor vehicles account for about 90% of the CO in Boston,[17] so reduction in VMT is a crucial component of the effort to ameliorate CO levels. Photochemical oxidants, known as smog or ozone, are produced through a reaction of sunlight, nitrogen oxides and hydrocarbons (HC). Motor vehicles are responsible for over 60% of all hydrocarbons in Metropolitan Boston,[18] and again, in order to be in compliance with the national air quality standards for photochemical oxidants, there must be a reduction in HC levels.

TABLE 28

VMT Saved through Parking Freeze

Worktrips Home Area	% of Parkers	# of Autos Daily	Average One-way Distance not Traveled (miles)	One-way Total VMT Foregone (mile
1. Boston	18.2	1165	5.8	6757
2. Inner Suburbs	14.4	922	9.1	8390
3. Northwest	2.7	173	21.7	3754
4. South within 128	8.4	538	9.3	5003
5. South within 15 Miles	7.6	487	15.3	7451
6. South within 20 Miles	5.5	351	20.2	7090
7. South within 25 Miles	3.5	224	24.3	5443
8. Mass. Turnpike within 15 Miles	6.3	402	14.1	5668
9. Mass. Turnpike within 25 Miles	5.0	320	22.2	7104
10. I-93 within 15 Miles	11.3	723	14.8	10700
11. I-93 within 25 Miles	1.3	83	27.6	2291
12. North Shore	9.4	602	14.3	8609
13. Other	6.4	410	30.0	12300
	100.0%	6400	14.15	90560

Daily Roundtrip Mileage = 181120

Non-work Trips

# of autos = 1600

Average one-way distance not travelled = 8 miles

1600 x 8 = 12800

Roundtrip = 25600 miles

TOTAL VMT Saved:

25600
181120
206730

Pollutants are emitted during the start-up, cold running and travel of the vehicle. As the number of automobile trips is reduced, and the vehicle miles travelled are decreased, the associated emissions are thus lessened. Automobile emissions are also exacerbated by congestion. As cars are stalled in traffic, as frequently occurs during "rush" hours, there is less dispersion and more concentration of pollutants within a small area. If 6,400 core-generated cars were added to the morning and evening peak-periods, there would be a disproportionate increase in congestion levels due to the near-capacity Downtown road system.

Using the prediction rechniques found in *Transportation Air Quality Analysis - Sketch Planning Methods, Volume I*,[19] the trip and VMT-associated HC and CO emissions were estimated for the automobile travel foregone as a result of the Parking Freeze. The analysis shows that as much as 12.00 metric tons of CO, and .96 metric tons of HC may have been saved. These amounts are also compared to region-wide emissions in Tables 29 and 30. Unlike HC, CO has a localized effect, and the improvement in Downtown air quality with respect to CO is more pronounced.

TABLE 29

Analysis of CO Savings for 1980

Start-up Emissions	
16,000 one-way trips x 251 grams/trip	4,016,000 grams
Travel Emissions	
Work trips - (at 20 mph) 181,120 miles x 39.5 grams/mile	7,154,240 grams
Non-work trips - (at 25 mph) 25,600 miles x 32.3 grams/mile	826,880 grams
Total Emissions Saved	11,997,120 grams/day
Comparisons to Region	
One gram = 1×10^{-6} metric tons	12.0 metric tons/day
1980 estimated daily regionwide CO emissions from mobile sources	2404 metric tons/[2] day
Regionwide reduction in CO = 12.0 ÷ 2404 =	.0050 or 0.5%

TABLE 30

Analysis of HC Savings for 1980

Start-up and Evaporative Emissions	
16,000 one-way trips x 15.9 grams/trip (start-up)	254,400 grams
16,000 one-way trips x 8.3 grams/trip (evaporative)	132,800 grams
Travel Emissions	
Work trips - (at 20 mph) 181,120 miles x 2.85 grams/mile	516,192 grams
Non-work trips - (at 25 mph) 25,600 miles x 2.4 grams/mile	61,400 grams
Total Emissions Saved	964,792 grams/day
Comparisons to Region	
One gram = 1 x 10^{-6} metric tons	.96 metric tons/day
1980 estimated daily regionwide HC emissions from mobile sources	364 metric[21] tons/day
Regionwide reduction in HC = .96 ÷ 364 =	.0026 or .26%

VII. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The most important parking management programs that have been effectuated in Boston over the last decade have been the planned decrease in on-street parking, and a restriction on the growth of commercial parking spaces through the Parking Freeze. From the foregoing analysis, it appears that the Freeze has not had a detrimental impact on development, nor, on retail sales and has achieved its originally stated objectives of: stabilizing the number of commercial parking spaces in the Downtown; providing planning standards for new facilities which are in accordance with City and regional transportation policies; encouraging mass transit usage; and working toward preventing the further deterioration of air quality. Specifically, the following overall transporation, land use, parking, development and economic changes have occurred over the last several years. Some of these have happened in spite of, as an indirect result, or as a direct result of the Parking Freeze. They are:

1. Parking

- The number of commercial (Freeze) spaces has remained constant since 1973, but the net number of restricted (non-Freeze) spaces has increased by 3,000, and excluding residential spaces, the net growth has been 2,100 spaces, although half of these were under construction prior to the Freeze;
- The number of on-street parking spaces has decreased and enforcement of parking regulations has improved;
- The number of legal, on-street spaces is further being eroded through the institution of residential parking programs in neighborhoods contiguous to retail and office activity;
- New public parking spaces have tended to be located in garages associated with new development, rather than in surface lots, and have been in compliance with the Freeze Permit criteria, indicating improvements in design, location and function over existing facilities;
- The Freeze criteria have also been geared toward the phasing out of lots in order to conserve valuable land for better uses, and successfully discouraged the demolition of several buildings in order to construct in-fill, and open-air lots. Although undocumented, it is believed that demolition was avoided in even more instances, because owners had good reason to believe that their request for a parking lot as an "interim use" would be turned down;
- Although the number of restricted (exempt) spaces has increased, the number of facilities has slightly decreased, indicating a trend toward larger facilities;
- The total number of parking spaces has increased by 5% since 1973, whereas employment increased by approximately 9% over that same time period;

- According to projections made in 1972, the number of additional parking spaces that would have been built without the Freeze range from 6,000 to 9,000, based on actual employment growth, so the Freeze has had a real impact on restraining the growth of parking;

- The ratio of the one-hour parking rate to the daily maximum rate has dropped since 1972. That means there is less incentive for turnover of spaces after that amount of time has passed;

- The average price of parking in Boston Proper has generally risen in accordance with the rate of inflation since 1972;

- The Freeze has been sufficiently flexible in issuing permits well in advance of project completion, eliminating the uncertainty of obtaining permits, and simultaneously allowing temporary facilities to serve parking demands until new development is on-line;

- Both the Zoning Code and the Parking Freeze have allowed the City to exert leverage in regard to parking policy for public purposes. For example, the Sargent's Wharf open-air lot was required to accommodate tour buses and allow spaces for residents of the North End as conditions for its Freeze Permit.

2. Transportation

- Core-bound traffic volumes have probably increased slightly since 1973, but there are indications that mode split for Downtown employees is moving toward increased transit usage, and that auto occupancies are rising.

- If the Parking Freeze had not been established, it is likely that 8,000 more cars/day would be traveling to Boston Proper, predominately in the peak-periods, adding to congestion, and representing as much as 9% of the current vehicle miles traveled for worktrips to the core.

3. Air Quality

- Estimates show that the Parking Freeze may have prevented the addition of as much as 12.00 metric tons of carbon monoxide, and .96 metric tons of HC to the air in the Metropolitan area daily. Although both of these appear small in relation to the total region-wide daily emissions, it is not an insignificant amount. In particular, for CO, the impacts are more localized; if comparable localized data were available, it would show a notable reduction in Downtown CO levels.

4. Development

- Over the last ten years, there has been an increase in Downtown employment of 13%, and between 1975-1980, an increase of 5%.

- Over two million square feet of office space have been developed between 1975-1980, and five million square feet are currently under construction;

- The steady decline in retail sales exhibited since the fifties has recently turned around as Downtown expeditures have increased by 3-4% between 1977 and 1979;
- The average number of employee parking spaces per 1,000 square feet in new buildings has not decreased since the establishment of the Parking Freeze; however, there has been a narrowing of the range of spaces provided, and no extremely high ratios have been provided within recent years.

B. Future Concerns

Despite the positive impacts detailed above, some concerns remain regarding the future operation of the Parking Freeze, namely:

- Will the Freeze, in the long run, have a negative impact on redevelopment?
- Will there continue to be a sufficient number of eliminated facilities to be traded-off against desired new spaces?
- As employment grows in accordance with projections, and if parking spaces become scarce, will access to the Downtown be hampered?
- If exempt employee spaces continue to increase, which is in oppostion to City transportation policy and the goals of the Freeze, should there be some change in the definition of spaces included in the Freeze?

1. Future Impact on Development

The Freeze has not had a negative impact on development, which was one of the primary concerns prior to Freeze establishment. Downtown development is now a "boom" period, and it is difficult to isolate the influence on the Freeze, which is but one aspect of the development climate. Furthermore, several contacts with developers have not elicited any expression of strong feelings from them regarding detrimental effects of the Freeze upon on-going projects.

However, it has been questioned that, if economic and developmental factors were not so favorable in Boston, would the Freeze take on greater importance as a drawback relative to suburban locations? At the present time, it is unclear whether this could occur. However, the administration of the Freeze has been creative and flexible, and it could be expected that any difficulties would be handled successfully. It is suggested (see following section "Recommendations") that the Freeze be subject to a review at least every three years, and if problems do arise, changes in the Freeze can be implemented.

2. Trade-off Spaces in the Future

As more obsolete facilities are retired in the current healthy development climate, the possibility exists that there may not be a sufficient number of available trade-off spaces in the future to provide new development with proximate parking. In the near term, several facilities are considered to be outmoded, and can be identified as potential trade-offs for new development. One argument offered for the inclusion of employee spaces in the Freeze is that this additional pool of spaces would give the Freeze more flexibility in allocation of spaces. However, within the next five years or so, there appears to be enough development pressure and sufficient numbers of spaces poorly located or in outmoded structures to supply the Bank with spaces.

3. Future Access to the Core

From the information available, core-bound traffic appears to be increasing, albeit slowly. The Freeze has stemmed this growth by restricting the expansion of parking spaces.

There are indications that parking utilization has decreased over the last several years. Since employment is up, and retail sales have increased, the decline in parking is not due to fewer people coming Downtown, but most likely attributable to rising fuel costs, and secondarily, higher parking fees.

Overall, parking demand is not overtaking the supply, although in some areas of the City, parking is tight. The planned large parking facilities at South Station (approximately 2,000 spaces) and Lafayette Place (1,100 spaces) should alleviate shortages in those areas.

4. Definition of Freeze Spaces

Growth in employee and other non-freeze spaces is an aspect of the Freeze which is not congruent with parking management policy. The exclusion of employee parking from the Freeze is a provision that has been controversial from the start.

The City does have some influence on employee parking through the Zoning Board of Appeal, which can turn down requests if non-residential parking is not in compliance with its criteria. The APCC has jurisdiction over commercial parking, and in mixed-use garages, can exert influence over the employee parking. However, this influence is sometimes contradictory, since basically, due to its economic restraint, commercial parking is more desirable than usually free employee parking. However, the APCC has only a limited number of commercial spaces to be allocated, whereas employee spaces can be thought of as unlimited in number. It has happened that a developer came to the Commission with a request for a number of commercial spaces, which was too high to be fully supplied by the Bank. The request was then reduced, but the remainder of the spaces were converted into employee or other designated spaces, which the Commission was unable to prevent. Although in many cases, commercial spaces would be more desirable from a developer's viewpoint since fees could be charged, it is still felt that some employee (or at least executive) spaces are needed in order to attract tenants.

The real or perceived requirements of developers to offer attractive and competitive rental terms to prospective tenants, as well as the parking and transportation policies of the City must continue to be balanced against one another in the future.

C. Parking Management Options for the Future

Some options for Downtown parking management are listed below. It is recommended that any option which is ultimately selected included a re-evaluation of the operation of the Freeze at least every three years. This periodic review by the APCC could also be conducted prior to the expiration of three years should changes in parking, transportation, air quality and developmental conditions warrant an earlier examination of the Freeze operation. A data base of usage characteristics of on-street and off-street parking should be maintained.

The following options can be considered individually, or combined. The options, with comments, are:

1. Parking Freeze

I. Continue the Parking Freeze in its Present Form

The Parking Freeze has done a good job of limiting the number of commercial spaces in Downtown. It can be stated positively that the number of spaces existing now is less than would otherwise be the case.

Approximately 5,000 spaces have been exempted from the Freeze, and the net growth in non-residential exempt spaces has been about 2,100 since 1973. This represents a 5% increase in spaces over the past seven years, a relatively small amount, considering the amount of new development activity. It could be expected that if exemptions were continued, growth in parking spaces would not surpass that occurring in the previous time period. Furthermore, retention of the exemption gives developers the discretion to include as many VIP spaces as they deem necessary to attract tenants to downtown locations. It is widely perceived that decision-makers do consider parking for themselves as an important amenity when they choose between suburban and downtown locations, and in selection of a building. Adding another layer of regulation to the present Freeze and discounting a developer's intuition about how much parking is required for development could have negative repercussions for rental and office development.

II. Continue the Parking Freeze in its Present Form With More Restrictions on Employee Spaces

Recognizing that provision of some employee spaces appears necessary to support certain kinds of development, impose more stringent restrictions in their use. One possibility is to set an absolute limit on the amount provided, for example, 0.2 per 1,000 square feet of office space, through the Zoning Code. If the amount exceeds that limit, a variance would have to be requested from the Zoning Board of Appeal. Criteria would be established to ensure that any excess would be used in the most efficient way possible. Some suggested requirements are:

1. 50% of the excess be set aside for multiple occupancy and/or fleet vehicles.

2. The same amount of money used to subsidize employee parking would be used to subsidize transit passes, or to initiate vanpool programs, flexitime, and/or staggered work hours.

3. A payment to the City, in lieu of taxes, of 20% of the market value of the spaces, based on commercial parking fees in the vicinity.

It may seem contradictory, in that developers are "rewarded" with parking spaces if they implement transit incentives. However, it can be viewed as a technique to escalate the costs of providing a certain level of parking for employees (basically for other than VIP's, if the ratio is too high) and simultaneously encouraging employees who might otherwise be parking in public facilities to take transit or carpool.

III. Expand the Freeze Definition to Include All Non-residential Spaces

The least desirable parking spaces from an air quality and transportation view, are employee spaces. Since the number of these spaces is increasing, they should be limited by institutionalized means, such as through the Freeze, rather than restrained through the marketplace and indirect forms of persuasion.

Any eliminated non-residential spaces, whether commercial, employee, or visitor/customer, would be added to the Bank. This would expand the number of spaces available for withdrawal from the Bank, yet places a "cap" on the total number of parking spaces in Boston Proper. Spaces in the Bank would be identified as to their former use, i.e., restricted (exempt) or public (Freeze). Spaces could be allocated from the Bank for use as either restricted or commercial, but commercial spaces in the Bank could only be allocated as commercial spaces. Thus there would be a gradual decline in the number of employee spaces in the future, as they are added to the Bank and given out as commercial spaces. The sum of restricted and commercial spaces, however, would be a stable amount, pegged at 55,497, the number currently existing, and about 20,000 above the present Freeze Bank amount.

This option would give developers more opportunity to obtain commercial (pay) parking spaces, commensurate with their requirements. It would also give the APCC more flexibility in the distribution of parking, by placing more parking spaces under their control. This also would allow the Freeze ceiling to rise by other than an arbitrary number, yet would hold the level of parking constant.

IV. Abolish the Freeze

One possibility to be considered is to abolish the Freeze, and the responsibility for regulating parking would fall upon the Zoning Board of Appeal. The Board presently has jurisdiction over parking within the Restricted Parking District, which encompasses a larger area than the Parking Freeze District. All non-residential parking is a Conditional Use within the District, and the criteria used for evaluating parking are similar to those applied in the Parking Freeze. The rising expense of providing parking, coupled with the jurisdiction of the Board of Appeal, could suffice in regulating parking in Downtown Boston, streamlining the regulatory process.

However, the Board does not have the investigative capabilities of the APCC, and it is feared that this option could result in a reduction in a reduction in the stringency with which the criteria are applied. All in all, most parties, including developers, are pleased with the administration of the Freeze. This option is therefore not recommended.

D. Recommendations

Of concern here are many factors. Continued stabilization and perhaps even decrease in automobile congestion and reduction in emissions are the major thrust of the Freeze, and it is anticipated that this positive impact will be sustained in the future. Also of concern is the relationship between accessibility and the attractiveness of Boston as a place to work, shop and visit.

The choice for the future is one of striking a balance between accessibility and the undeniable limitations on the Downtown from handling much more traffic.

Clearly, the vast amount of parking thought to be crucial in the past, is not. On the other hand, as much as some would insist that all trips can and should be made by transit, it is not feasible to expect that happening without deleterious effects on the Downtown economy. Assuming that development in the Downtown is still desired and desirable, parking can be used to shape and support development.

1. Freeze Recommendations

A consensus has been obtained from the study participants that Option II, placing more restrictions on employee spaces, should be pursued (see Appendix E). At the present time, legal and other problems regarding the criteria to be used are being worked out. This option has the advantages of continuing the Freeze, which has worked very well, yet including some restrictions on employee spaces.

2. Other Recommendations

It is further recommended that the City work toward implementing such policies as higher ratios of hourly rates to daily maximums and reserved floors for short-term parkers in its own facilities. It is recommended that the ratio of the daily maximum to the one-hour rate be at least 4.

3. Air Quality Impacts of Recommended Alternative

If some or all of the elements of Option II are ultimately adopted, further reductions in VMT can be expected, with corresponding improvements in air quality. At this time, the implementation status of these elements is uncertain. However, likely estimates of reductions in VMT, should these options be implemented, are presented below.

1. Restriction On Employee Spaces

If the number of employee spaces provided in a development are limited to a maximum of 0.2 spaces per 1,000 square feet, by how much would this reduce the future supply of employee parking?

Recently-constructed office buildings (since 1977) with or without parking result in an average of .19 employee spaces/1,000 square feet. However, if these individual buildings having a higher ratio than 0.2 were to conform to that standard, there would have been 204 less parking spaces built, or an overall decrease of about 25% in development-associated employee parking spaces.

Since there appears to be a trend toward providing less employee parking spaces, it would be an overstatement to assume that this regulation would result in a future 25% decrease in employee spaces. However, it would be fair to say that at least a 10% decrease in spaces provided would be realized. Assuming that seven million square feet of new office space will be built by 1990 (1.3 million from 1984-1990), and that the average number of spaces provided would be at a similar ratio to those in recently constructed buildings, 1,540 new employee spaces would result. (This average includes buildings that may be constructed with no parking). If higher than average ratios are no longer permitted, it could be expected that at least a 10% decrease in spaces, or 154 spaces, would be "saved" through this regulation.

These 154 spaces would have been designated for employees, and an average worktrip distance of 14 miles, or 4,300 round-trip miles would be saved each day. This can be translated into emission savings in the region of approximately 128,000 grams/day of CO, and 10,000 grams/day of HC.

2. A Payment To The City, In Lieu Of Taxes, Of 20% Of The Market Value Of The Spaces, Based On Commercial Parking Fees In The Vicinity

If this action is both politically and legally feasible, it is possible that these additional costs of operation of employee parking would be borne by the employer, and not passed on to the user. In some cases, however, these costs would be imposed on the user. This regulation would have two impacts: one to raise the cost of providing employee parking in future developments and thus discourage its provision; and secondly, raising the cost of driving for employees, and providing more of an incentive to carpool or not to drive at all.

There are approximately 13,400 existing designated employee spaces. If 5% of these current users would be persuaded to carpool or stop driving, approximately 650 less automobiles would enter the city each day, for a savings of up to 20,000 VMT's per day, 540,000 grams of CO and 43,000 grams of HC.

3. Require Subsidy For Transit Passes And Other Energy-Saving Transportation Programs To The Same Extent As Provided For Automobile Commuters

This regulation would apply only to new developments, and would serve to make the provision of employee parking more expensive, and make transit usage more attractive. Assuming that 10% less employee spaces would be thus built, a savings of 154 spaces by 1990 would be realized, or 4,300 round-trip VMT's per day. The regional decrease in daily automobile emissions would approximate 128,000 grams of CO and 10,000 grams of HC.

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17. Op. Cit., P. 20.
18. Op. Cit., P. 25.

19. Cambridge Systematics, Inc., Transportation Air Quality Analysis - Sketch Planning Methods, Volume I, for Office of Transportation and Land Use Policy, Environmental Protection Agency, December, 1979, Appendix D.

20. CTPS, *ibid*., P. 21.

21. CTPS, *ibid*., P. 25.

APPENDIX A: CHRONOLOGY OF PARKING FREEZE ACTIONS

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance	Exe tio
Original Balance:			1372	
Spaces Permitted on April 15, 1977:		1125		
31 -- 52-56 Chatham St. /Edison/				
168 -- Essex, South, Atlantic /Rose/				
121 -- Union Wharf (90-day) /Leeder/				
204 -- D-10 (Commercial & State) /BRA/				
230 -- Sargent's Wharf /BRA/				
206 -- Raymond's (Bristol/Bedford-West) /BRA/				
110 -- Fulton St. (Residential) /BRA/				
55 -- Aquarium Lot (250 State St.) (180-day) /BRA/				
Spaces Denied:				
56 -- 41-49 Milk St.				
60 -- 400-406 Stuart St.				
Spaces Exempted:				
227 -- 60 State St. (Employees & Patrons only)				22
Balance as of May 24, 1977:			247	
Spaces Permitted on May 24, 1977:		60		
60 -- 400-406 Stuart St. /Allright Boston Parking Co./				
Spaces Permitted on June 14, 1977:		50		
15 -- 16-18 Kingston St. /Western Auto Parks/				
35 -- 191 Kneeland St. /Brown/				

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance
Spaces Exempted:			
61 -- 234 Berkeley St. /Bonwit Teller/ (Patrons only) *Added to pre-freeze total			
Balance as of July 11, 1977:			137
Spaces Permitted on July 11, 1977:		31	
31 -- Raymond's Lot /BRA/			
Permit Issued Independent of Bank:			
*267 -- E-8 (Dock Square) Garage			
Spaces Added on September 28, 1977:	77		
77 -- 321-323 Columbus Ave.			
Application Withdrawn on January 17, 1978:			
82 -- 176 Tremont St., 22-30 Avery St.			
Balance as of February 2, 1978:			183
Spaces Permitted on February 24, 1978:		11	
11 -- 34 Nashua St. (90-day)			
Spaces Added on March 27, 1978:	17		
17 -- Discontinuance of Chandler St. (On-street parking)			
Spaces Added on May 11, 1978:	121		
121 -- Union Wharf			
Permits Renewed (for one year): Total: 774 204 -- D-10			
206 -- Raymond's (Bedford & Bristol)			
55 -- Aquarium Lot (250 State St.)			
110 -- Fulton St.			
31 -- 52-56 Chatham St.			
168 -- Essex, South, Atlantic			

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance	Exem tion
Spaces Revoked on May 25, 1978:	11			
11 -- 34 Nashua St.				
Balance as of May 17, 1978:			321	
Spaces Permitted on May 25, 1978:		81		
50 -- 191 Kneeland St. /Owen Brown/				
3 -- 36-38 Lincoln St. /Barresi/				
28 -- 66-72 Church St. /Fitz-Inn/				
Spaces Exempted on July 21, 1978:				50
50 -- 178-180 Newbury St. (Residential)				
Spaces Added on July 26, 1978:	52			
52 -- 180 Newbury St.				
Garage Permits Issued (Independent of Bank):				
275 -- Transportation Building /EOTC/				
1500 -- Lafayette Place Garage /City of Boston/				
Permits Renewed (for one year): Total: 355				
230 -- Sargent's Wharf /BRA/				
15 -- 16-18 Kingston St. /Karas/				
60 -- 400-406 Stuart St. /Leeder/				
50 -- 191 Kneeland St. /Brown/				

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance
Balance as of September 7, 1978:			292
Spaces Permitted on September 7, 1978:		50	
11 -- Nashua St. /Cotting Co./			
39 -- Washington St. /Coffman/			
Spaces Denied on September 7, 1978:			
85 -- Stanhope Garage (Dedham St.)			
Spaces Exempted on September 13, 1978:			
50 -- 2-10 Commonwealth Ave. /Ritz Carlton/ (Residents)			
81 -- 4-6 Newbury St. /Ritz Carlton/ (Hotel guests)			
Balance as of September 8, 1978:			242
Spaces Added on October 5, 1978:	31		
31 -- Raymond's /BRA/			
Balance as of October 6, 1978:			273
Spaces Permitted on December 7, 1978:		9	
9 -- 159-163 Milk St. /Custom Auto Parks/			
Spaces Denied on December 7, 1978: Total: 1220 85 -- Stanhope Garage			
Spaces Renewed for one year:			
85 -- 191 Kneeland St. /Brown/			
3 -- 36-38 Lincoln St. /Barresi/			
15 -- 16-18 Kingston St. /Western Auto Parks/			

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance	Exem tion
31 -- 52-56 Chatham St. /Edison/				
39 -- 715-727 Washington St. /Stuart Street Parking Co./				
11 -- 34 Nashua St. /Cotting Co./				
60 -- 400-406 Stuart St. /Allright Boston Parking Co./				
168 -- Essex & Atlantic /Rose/				
28 -- 66-72 Church St. /Fitz-Inn/				
110 -- 56-70 Fulton St. /BRA/				
230 -- Sargent's Wharf /BRA/				
55 -- 250 State St. /BRA/				
179 -- Commercial & State /BRA/				
206 -- Bedford & Bristol /BRA/				
Balance as of December 19, 1978:			264	
Spaces Permitted on January 23, 1979:		171		
171 -- Copley Place Garage				
Balance as of February 27, 1979:			93	
Spaces Permitted on April 23, 1979:		66		
6 -- 30-34 Boylston St. /Puglio/				
60 -- High & Oliver /Off-Street Service Co./				

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance
Spaces Denied:			
45 -- Commercial Wharf West			
Spaces Permitted but not shown in Balance:			
227 -- 60 State St. (Temporary loan from construction site of E-8, until it is completed)			
82 -- One Post Office Square Garage (To be shown on Bank Balance 1/81)			
Spaces Exempted:			
318 -- One Post Office Square			
Balance as of April 24, 1979:			27
Spaces Issued Independent of Bank:			
1267 -- Lafayette Place Garage			
Spaces Eliminitated on August 23, 1979:			
700 -- Hayward Place Garage (Credited to Lafayette Pl.)			
Balance as of September 27, 1979:			27
Spaces Exempted on September 27, 1979:			
190 -- Long Wharf Hotel /Boston Properties/ (Hotel guests)			
210 -- 150-186 Huntington Ave. /The Greenhouse/ (Residents)			
230 -- 250 Washington St. /Devonshire Towers/ (Tenants)			
Spaces Exempted on November 26, 1979:			
99 -- 50 Milk St., Devonshire-Milk (Employees)			
Spaces Added on December 12, 1979:	125		
400 -- 7-15 Eliot St. Garage			
275 Credited to Transportation Building			

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance	Exemp tions
(100 Employee spaces also eliminated)				(-10
Permits Renewed for one year on December 20, 1979:				
Total: 1089				
85 -- 191 Kneeland St. /Brown/				
3 -- 36-38 Lincoln St. /Barresi/				
15 -- 16-18 Kingston St. /Western Auto Parks/				
31 -- 52-56 Chatham St. /Edison/				
39 -- 715-727 Washington St. /Stuart St. Parking Co./				
11 -- 34 Nashua St. /Cotting Co./				
60 -- 400-406 Stuart St. /Allright Boston Parking Co./				
168 -- Essex & Atlantic /Rose/				
28 -- 66-72 Church St. /Fitz-Inn/				
110 -- 56-70 Fulton St. /BRA/				
230 -- Sargent's Wharf /BRA/				
55 -- 250 State St. /BRA/				
179 -- Commercial & State /BRA/				

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance
9 -- 159-163 Milk St. /Custom Motor Mart/			
6 -- 30-34 Boylston St. /Puglio/			
60 -- 156-158 High St. /Off-street Service Corp./			
Spaces Exempted on December 20, 1979:			
30 -- 34 Cooper/23-33 Stillman /Brogna, D'Amore, Syfers/ (Patrons)			
80 -- Armory Building, Columbus Ave. /Boston Park Plaza Hotel Trust/ (Hotel guests)			
Spaces Added on December 31, 1979:	89		
89 -- 7-13 Dore St./715-727 Washington St.			
Spaces Added on January 2, 1980:	72		
135 -- 250 State St. (55 permitted, 80 previously existing) (63 credited to E-8 Garage)			
Balance as of February 6, 1980:			313
Spaces Added on February 9, 1980:	60		
60 -- 50 Milk St./Devonshire St.			
Balance as of February 10, 1980:			373
Spaces Permitted temporarily on April 3, 1980: (Until the completion of E-8 Garage)		221	
72 -- 250 State St.			
89 -- 7-13 Dore St./715-727 Washington St.			
60 -- 50 Milk St./Devonshire St.			
Spaces Exempted on April 4, 1980:			
6 -- 540 Commercial St. /Lavender Trust/ (Residents)			

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance	Exem- tion
55 -- Viviendas La Victoria II /ETC Development Corp./ (Residents)				
18 -- 77 Salem St. /77 Salem St. Realty Trust/ (Residents)				
44 -- Grand Bostonian Hotel North & Blackstone (Hotel guests)				
265 - Dalton Street Hotel /Dalton Associates/ (Hotel guests)				
Balance as of April 4, 1980:			152	
Spaces Added on June 18, 1980:	95			
70 -- 250 Washington St.				
25 -- Commercial & State				
Balance as of June 19, 1980:			247	
Spaces Added on July 9, 1980:	221			
221 -- From expiration of temporary permit issued April 3, 1980				
Balance as of July 10, 1980:			468	
Spaces Added on July 11, 1980:	25			
25 -- 6-10 Eliot St. (Credited to Copley)				
Spaces Permitted on July 24, 1980:		221		
204 -- E-8 Garage (Dock Square-Clinton Street)				
From the following expired temporary permits:				
25 -- Commercial & State				
70 -- 250 Washington St.				
72 -- 250 State St.				
37 -- 50 Milk St.				

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance	Ex ti
Balance as of July 25, 1980:			272	
Spaces Added on July 24, 1980:	20			
20 -- 20-26 Exchange Pl./25-27 Kilby St.				
Balance as of July 27, 1980:			292	
Spaces Exempted on September 4, 1980:				
93 -- Exchange Pl. (Employees)				
20 -- 333 Commonwealth Condo (Residents)				
Exempted spaces withdrawn				
44 -- Grand Bostonian Hotel:				
Spaces Added on September 24, 1980:	209			
209 -- 150-180 Huntington Ave. (Credited to Copley)				
Balance as of September 30, 1980:			501	
Spaces Added on October 1, 1980:	291			
334 -- Lincoln/Essex St. Garage (43 credited to Lafayette Pl.)				
Spaces Permitted on October 1, 1980:		61		
61 -- Lincoln/Essex Temporary Lot				
Balance as of November 15, 1980:			731	
Spaces Permitted on December 4, 1980:		32		
20 -- 683 Boylston St. (Added to existing lot)				
12 -- 11-17 Kingston St.				

PARKING FREEZE BANK CHRONOLOGY

	Additions	Subtractions	Bank Balance	Exem- tions
Permits Renewed for one year on December 4, 1980:				
Total: 1003				
85 -- 191 Kneeland St.				
3 -- 36-38 Lincoln St.				
15 -- 16-18 Kingston St.				
31 -- 52-56 Chatham St.				
11 -- 34 Nashua St.				
77 -- 400-406 Nashua St.				
168 -- Essex & Atlantic				
28 -- 66-72 Church St.				
110 -- 56-70 Fulton St.				
230 -- Sargent's Wharf				
179 -- Commercial & State				
6 -- 30-34 Boylston St.				
60 -- 156-158 High St.				
lance as of December 5, 1980:			699	
Spaces Added on December 8, 1980:	140			
140 -- 44 Dalton St.				
lance as of December 9, 1980:			839	
Spaces Permitted on January 1, 1981:		82		
82 -- One Post Office Sq. (Permitted April 23, 1979)				
lance as of January 1, 1981:			757*	
		TOTAL EXEMPTIONS:		2066

4 of these spaces are designed for Copley Place, so actual
mber available = 523

APPENDIX B:

BACK BAY ON-STREET PARKING SURVEY

BOYLSTON STREET

Cross Streets	Number of Legal Spaces	Number of Autos parked @ 9 A.M.	Outs	Ins	Number of Autos parked @ 11 A.M.	Outs	Ins	Number of Autos parked @ 1 P.M.	Outs	Ins	Number of Autos parked @ 3 P.M.	Resident Stickers	Total Out-of-State	Illegally Parked Autos	Number of Vehicles parked 9 - 3	Total Number of Vehicles Parked
Arlington to Berkeley	42	48	23	26	51	25	29	54	23	24	54	0	7	12	13	127
Berkeley to Clarendon	28	42	17	21	44	21	21	44	21	26	49	0	11	23	11	110
Clarendon to Dartmouth	43	45	24	25	44	25	22	44	17	18	45	0	9	9	12	110
Dartmouth to Exeter	22	26	16	20	31	19	17	31	21	20	29	0	6	11	3	83
Exeter to Fairfield	8	30	14	17	31	18	16	28	18	22	33	0	2	61	4	85
Fairfield to Gloucester	11	21	11	18	28	20	13	21	15	16	22	0	7	29	4	68
Gloucester to Hereford	16	29	12	16	33	17	16	29	21	19	27	0	5	49	3	80
Hereford to Mass. Ave.	6	11	0	7	18	3	4	15	5	3	13	0	4	0	2	25

March 4, 1981

Both Sides of Street

Cross Streets	Number of Legal Spaces	Number of Autos Parked @ 9:00 A.M.	Empty Spaces*	Outs	Ins	Number of Autos Parked @ 11:00 A.M.	Outs	Ins	Number of Autos Parked @ 1:00 P.M.	Outs	Ins	Number of Autos Parked @ 3:00 P.M.	Vehicles Parked from 9 - 3	Total Number of Vehicles	Illegally Parked Cars
Arlington to Berkeley	41	50	2	22	20	48	18	20	50	20	16	46	18	106	26
Berkeley to Clarendon	34	38	3	17	21	42	20	14	36	13	13	36	14	86	20
Clarendon to Dartmouth	35	50	0	24	22	48	20	16	44	24	26	48	14	114	32
Dartmouth to Exeter	36	42	10	20	28	50	30	28	48	--	--	--	15	98	15
Exeter to Fairfield	45	44	8	15	18	47	37	35	45	--	--	--	10	97	5
Fairfield to Gloucester	36	33	12	17	27	43	24	23	42	--	--	--	14	83	13
Gloucester to Hereford	29	25	11	11	20	34	22	22	34	--	--	--	9	67	5
Hereford to Mass. Ave.	40	34	17	18	16	32	16	29	45	--	--	--	11	79	3
TOTAL	296	316	63	144	172	344	187	177	344	47	55	130	95	730	119

*Legal and illegal spaces

COMMONWEALTH AVENUE

Both Sides of Street

Survey Date: Friday,
February 27,
1981

Cross Streets	Number of Legal Spaces	Number of Autos Parked @ 9 A.M.	Empty Spaces	Outs	Ins	Min. Number of Autos Parked @ 11:00 A.M.	Outs	Ins	Number of Autos Parked @ 2:00 P.M.	Vehicles Parked 9 - 2	Resident Stickers	Total Number of Vehicles	Ille-gally Parked Cars
Arlington to Berkeley	48	52	0	13	0	39	3	13	49	36	5	65	3
Berkeley to Clarendon	43	60	0	6	0	54	0	6	60	54	14	66	4
Clarendon to Dartmouth	44	57	0	8	0	49	1	8	47	48	20	65	2
Dartmouth to Exeter	44	54	0	7	0	47	8	7	46	39	17	61	3
Exeter to Fairfield	48	57	0	10	0	47	6	6	47	47	17	63	0
Fairfield to Gloucester	40	42	0	3	0	39	2	2	39	27	12	44	0
Gloucester to Hereford	31	30	0	3	0	27	5	2	22	20	8	32	0
Hereford to Mass. Ave.	51	49	0	18	0	31	7	14	38	24	10	63	2
TOTAL	349	401	0	68	0	333	32	58	348	295	103	459	14

Cross Streets	Number of Legal Spaces	Number of Autos parked @ 9 A.M.	Outs	Ins	Number of Autos parked @ 11 A.M.	Outs	Ins	Number of Autos parked @ 1 P.M.	Outs	Ins	Number of Autos parked @ 3 P.M.	Resident Stickers	Total Out-of-State	Illegally Parked Autos	Number of Vehicles parked 9 - 3	Total Number of Vehicles Parked
Arlington to Berkeley	47	57	16	11	60	29	27	57	23	16	56	20	24	8	17	111
Berkeley to Clarendon	43	49	22	21	51	30	28	49	17	15	49	11	37	1	13	113
Clarendon to Dartmouth	44	47	17	16	46	17	26	51	13	11	46	11	16	3	14	100
Dartmouth to Exeter	44	36	12	26	51	31	26	48	10	9	40	18	27	1	6	97
Exeter to Fairfield																
Fairfield to Gloucester																
Gloucester to Hereford																
Hereford to Mass. Ave.																
TOTAL	178	189	67	74	208	107	107	205	63	51	191	60	104	13	50	421

					BEACON STREET											
Cross Streets	Number of Legal Spaces	Number of Autos parked @ 9 A.M.	Outs	Ins	Number of Autos parked @ 11 A.M.	Outs	Ins	Number of Autos parked @ 1 P.M.	Outs	Ins	Number of Autos parked @ 3 P.M.	Resident Stickers	Total Out-of-State	Illegally Parked Autos	Number of Vehicles parked 9 - 3	Total Number of Vehicles Parked
Arlington to Berkeley	36	45	7	7	44	24	22	43	21	17	41	0	21	26	0	91
Berkeley to Clarendon	45	52	20	16	46	33	25	41	16	18	46	1	45	21	5	111
Clarendon to Dartmouth	45	47	17	19	49	27	24	47	26	17	40	15	20	8	10	107
Dartmouth to Exeter	38	25	14	11	23	20	18	24	13	9	22	12	21	28	9	63
Exeter to Fairfield																
Fairfield to Gloucester																
Gloucester to Hereford																
Hereford to Mass. Ave.																

					NEWBURY - BOYLSTON											
Cross Streets	Number of Legal Spaces	Number of Autos parked @ 9 A.M.	Outs	Ins	Number of Autos parked @ 11 A.M.	Outs	Ins	Number of Autos parked @ 1 P.M.	Outs	Ins	Number of Autos parked @ 3 P.MM	Resident Stickers	Total Out-of-State	Illegally Parked Autos	Number of Vehicles parked 9 - 3	Total Number of Vehicles Parked
Arlington	3	3	1	2	4	2	2	4	3	5	5	0	9	0	1	12
Berkeley	8	8	5	5	8	6	7	9	5	4	8	0	5	0	0	24
Clarendon	10	14	8	12	18	12	8	14	10	7	11	0	3	7	2	41
Dartmouth	4	8	3	4	9	5	5.	9	5	6	10	0	4	11	0	23
Exeter	8	15	6	6	15	11	8	12	6	6	13	0	17	0	3	35
Fairfield	14	14	2	5	16	7	5	17	6	5	16	0	3	3	8	29
Gloucester	16	19	5	4	18	9	8	18	8	4	13	0	2	11	7	35
Hereford	19	14	6	10	19	12	13	17	12	7	15	0	12	0	3	44
Mass. Ave.	0	2	0	1	3	1	2	4	2	2	4	0	1	2	1	7
TOTAL	26	97	36	49	110	65	58	104	57	46	95	0	53	34	25	250

CROSS STREETS -

ARLINGTON - MASS. AVE.

(Between Newbury and Commonwealth)

Survey Dates: Friday, February 27, 1981 and Wednesday, March 4, 1981
Weather: Fair

Cross Streets	Number of Legal Spaces	Number of Autos parked @ 9 A.M.	Outs	Ins	Number of Autos parked @ 11 A.M.	Outs	Ins	Number of Autos parked @ 1 P.M.	Outs	Ins	Number of Autos parked @ 3 P.M.	Resident Stickers	Total Out-of-State	Illegally Parked Autos	Number of Vehicles parked 9 - 3	Total Number of Vehicles Parked
Arlington																
Berkeley	22	8	3	5	8	4	3	10			9	0		1	4	19
Clarendon	19	11	5	9	13	12	9	13			14	0		14	4	36
Dartmouth	16	16	6	6	15	5	2	15			12	0		18	6	28
Exeter	18	19	9	9	21	-	-	21			-	0		0	10	33
Fairfield	19	15	7	7	15	-	-	15			-	0		2	4	28
Gloucester	18	21	10	10	20	-	-	20			-	0		1	6	41
Hereford	18	15	14	13	18	-	-	17			-	0		2	3	37
Mass. Ave.	17	13	13	13	15	-	-	15			-	0		0	0	40

Cross Streets	Number of Legal Spaces	Number of Autos parked @ 9 A.M.	Outs	Ins	COMMONWEALTH - MARLBOROUGH					Ins	Number of Autos parked @ 3 P.M.	Resident Stickers	Total Out-of-State	Illegally Parked Autos	Number of Vehicles parked 9 - 3	Total Number of Vehicles Parked
					Number of Autos parked @ 11 A.M.	Outs	Ins	Number of Autos parked @ 1 P.M.	Outs							
Arlington																
Berkeley	17	21	6	6	21	9	8	19	9	5	16	8	8	7	5	40
Clarendon	10	11	3	7	15	9	5	11	3	3	10	3	5	0	4	26
Dartmouth	10	12	0	1	13	3	2	12	2	5	14	8	4	7	8	20
Exeter	22	24	1	1	22	4	4	24	5	4	23	16	4	3	12	33
Fairfield																
Gloucester																
Hereford																
Mass. Ave.																
TOTAL	59	68	10	15	71	25	19	66	19	17	63	35	21	17	29	119

CROSS STREETS BEACON - MARLBOROUGH

Street	Number of Legal Spaces	Number of Autos Parked @ 9:00 A.M.	Empty Spaces	Number of Autos Parked @ 11:00 A.M.	Empty Spaces	Outs	Ins	Number of Autos Parked @ 1:00 P.M.	Empty Spaces	Outs	Ins	Number of Autos Parked @ 3:00 P.M.	Empty Spaces	Outs	Ins	Resident Stickers	Total Number of Out-of-State Vehicles	Illegally Parked Cars	TOTAL
Berkeley		18	0	17	1	3	2	18	0	5	5	17	1	1	0		4	0	
Clarendon		12	0	16	0	2	6	6	1	7	6	11	2	6	5		11	9	
Dartmouth		6	0	7	0	0	1	8	0	0	1	3	5	5	0		2	3	
Exeter		26	0	23	0	4	1	25	1	7	6	25	1	3	2		17	4	
Fairfield																			
Gloucester																			
Hereford																			
Mass. Ave.																			

APPENDIX C: PARKING FACILITIES ELIMINATED - 1973-1980

PUBLIC LOTS & GARAGES ELIMINATED 1973 - 1980

1973 MAP #	ADDRESS	LOT/GARAGE	NUMBER SPACES	COMMENTS
54	N. Washington St.	Lot	39	
69	228 Washington St.	Lot	70	
74	Parcel E-8	Lot	330	
	Parcel D-10		25	
75	Cross/Commercial	Lot	145	
84	Commercial/Atlantic	Lot	100	
85	Commercial/Atlantic	Lot	65	
87	Commerce/Market	Lot	50	
87/88	Aquarium	Lots	135	
88	232-282 State St.	Lot	30	
91	Commercial/Market	Lot	17	1975
96C	52-56 Chatham St. Boston Edison	Lot	31	1980
129	Atlantic Ave.	Lot	170	
136	Milk St.	Lot	50	
140	84 Summer St.	Lot	23	1976
145	Kingston/Essex	Lot	99	1975
146	65-69 Summer St.	Lot	42	1974
146A	Harrison Ave. Ext. BRA	Lot	76	1980
151	Hayward Pl.	Garage	700	
152	Code Realty	Lot	64	
167	Eliot St.	Garage	400	
171	Park Plaza	Lot	92	
172	Park Plaza 6-10 Eliot St.	Lot	22	
175	281 Tremont St.	Lot	17	
176	301-317 Tremont St.	Lot	68	1976
195/195A	Tremont/Common	Lot	80	1976
198	715-737 Washington/Stuart	Lot	89	1980
211	Summer/South	Lot	30	1974
235	Newbury St.	Lot	49	Converted to garage
245B	Newbury St.	Lot	52	
261	Dalton St.	Lot	140	1980
265	150-180 Huntington Ave.	Lot	209	
271	Carver St.	Lot	17	
272D	7-11 Yarmouth St.	Lot	22	
275	207 Columbus Ave.	Garage	77	
344	8-24 Shawmut Ave.	Lot	40	1976
-	Raymond's	Lot	130	
-	Raymond's	Lot	88	
-	Union Wharf	Lot	121	
-	Faneuil Hall		227	1975-6
-	South Market	On-street	30	1975
-	Commerce St.	On-street	24	1975
-	Eastern Ave.	On-street	60	1975
-	Concord St.	On-street	22	1975
-	Waterfront Park Sts.	On-street	111	1975
	TOTAL AVAILABLE FOR BANK:		4478	

PRIVATE LOTS & GARAGES ELIMINATED 1973 - 1980

1973 MAP#	ADDRESS	LOT/GARAGE	NUMBER SPACES	YEAR*
20	40 Accolon Way	Lot	12	
23	19 Lancaster St.	Garage	15	1977
40	525-529 Commercial St.	Lot	163	1977
81	Commercial/Eastern	Lot	15	1977
82	Lewis Wharf		40	1977
83	Lewis Wharf		27	1977
90	Service Road	Lot	10	1977
91	Long Wharf	Lot	150	--
92	Commercial/Market	Lot	25	1977
93	Commerce St.	Lot	30	1977
94	State/Commercial	Lot	35	1977
100	E. India Row/ Atlantic Ave.		16	1977
101	E. India Row		70	1977
111	113 Richmond St.	Lot	40	1977
119	25-27 Kilby St.	Lot	20	1977
129	Atlantic Ave.	Lot	50	1977
193	363 Tremont St.	Lot	25	1977
197	739-777 Washington St. (Tufts)	Lot	145	1980
204	47-53 Hudson St.	Lot	17	1977
207	Waverly/South	Lot	20	1977
210	Purchase/South	Lot	12	1977
224	317-325 Cambridge St.	Lot	25	1977
230	Cambridge St.	Garage	160	
257	Alley 444 MBTA	Lot	34	1980
258	Alley 444 Boston Fire	Lot	10	1980
271	422 Columbus Ave.	Lot	10	1977
273	1-5 Yarmouth St.	Lot	25	1977
274	Dartmouth St.	Lot	29	1977
276	321-323 Columbus Ave.	Lot	10	1977
277	303 Columbus Ave.	Lot	15	1977
284	515 Tremont/Berkeley	Lot	44	1978
295	Tremont St.	Lot	47	1980
298	Harrison Ave.	Lot	14	1980
301	1180 Washington St.	Lot	50	1977
304	Alley 710	Lot	12	1977
311	E. Newton/Sharon	Lot	31	1977
313	E. Canton St.	Lot	52	1977
319	Malden St.	Lot	47	1980
321	Waltham St.	Lot	11	1977
326	Harrison/Bristol	Lot	14	1977
327	307 Albany St.	Lot	25	1977
328	E. Berkeley St.	Lot	60	1977
330	Quinzani on 380 Harrison Ave.	Lot	10	1980
336	375 Broadway	Lot	50	1980
		TOTAL:	1722	

*1977 indicates 1973-1977

APPENDIX D- OFFICE DEVELOPMENT ACTIVITY - 1965-1980

DEVELOPMENT ACTIVITY, 1965-1980
OFFICE SECTOR

Year-Address	Area	Square Feet	New, Rehab or Conversion
1965			
800 Boylston St.	Back Bay	1,000,000	New
1966			
225 Franklin St.	Downtown	852,000	New
500 Boylston St.	Back Bay	54,000	New
70 Federal St.	Downtown	60,000	New
One Center Plaza	Downtown	200,002	New
		1,166,002	
1967			
Two Center Plaza	Downtown	200,000	New
20 Ashburton Pl.	Downtown	35,000	New
		235,002	
1968			
28 State St.	Downtown	590,000	New
100 Charles River Plaza	West End	130,000	New
25 New Chardon St.	Downtown	80,000	New
One Union St.	Downtown	25,000	Rehab
		825,000	
1969			
Three Center Plaza	Downtown	200,002	New
55 Court St.	Downtown	50,000	New
Sears Crescent	Downtown	40,000	Rehab
		290,002	
1970			
One Boston Pl.	Downtown	825,000	New
15 New Chardon St.	West End	75,000	New
		900,000	

Year-Address	Area	Square Feet	New, Rehab or Conversion
1971			
101 Huntington Ave.	Back Bay	432,000	New
100 Federal St.	Downtown	1,175,000	New
99 High St.	Downtown	775,000	New
45 School St.	Downtown	91,896	Rehab
One Dock Square	Downtown	13,300	Rehab
		2,487,196	
1972			
One Washington Mall	Downtown	140,000	New
21 Merchants Row	Downtown	17,500	Rehab
		157,500	
1973			
One Bulfinch Pl.	West End	45,000	New
One Beacon St.	Downtown	1,020,000	New
141 Tremont St.	Downtown	66,000	New
		1,131,000	
1974			
30 Winter St.	Downtown	105,000	New
545 Boylston St.	Back Bay	85,000	New
Pilot House at Lewis Wharf	Waterfront	23,000	New
210 Commercial St.	Waterfront	16,110	New
One Winthrop Sq.	Downtown	73,000	New
		302,110	
1975			
245 Summer St.	Downtown	910,000	New
Hancock Tower	Back Bay	2,000,000	New
One Federal St.	Downtown	1,103,000	New
50 Staniford St.	West End	200,000	New
100 Summer St.	Downtown	1,000,000	New
		5,213,000	
1976			
Federal Reserve Bank	Downtown	1,138,500	New
55 Summer St.	Downtown	140,000	New
		1,278,500	

Year-Address	Area	Square Feet	New, Rehab or Conversion
1977			
175 Federal St.	Downtown	200,000	New
60 State Street	Downtown	700,000	New
South Market Building	Waterfront	90,000	Rehab/Conv.
		990,000	
1978			
North Market Building	Waterfront	80,000	Rehab/Conv.
1979			
One McKinley Square	Downtown	36,000	Rehab
Hamilton Realty	Downtown	25,000	Rehab
37 Newbury St.	Back Bay	8,200	Rehab/Conv.
		69,200	
1980			
268 Summer St.	Fort Point Channel	72,000	Rehab/Conv.
Harbor Plaza	Waterfront	100,000	Rehab/Conv.
International House	Downtown	30,000	Rehab/Conv.
		202,000	

APPENDIX E: LETTER FROM BOSTON AIR POLLUTION CONTROL COMMISSION

Boston

June 26, 1981

Commissioner H. Joseph Powderly
City of Boston
Traffic and Parking Department
1 City Hall Square
Boston, MA 02201

Dear Commissioner Powderly:

A presentation of the draft Boston Parking Program study under Section 175 funds was given by Ms. Ellen Collins of the Boston Redevelopment Authority at the City of Boston Air Pollution Control Commission meeting held on June 25, 1981. The Commission was very impressed with the detail and thoroughness of the draft report and will review and comment on the entire text within the next week. These comments will be forwarded to you as soon as they are available.

In addition, the Commission extensively discussed the Parking Management Options for the Future. As a result of this discussion, the Commission endorsed the concept of continuing the parking freeze in its present form and placing additional restrictions on employee spaces. These additional restrictions should include a limit on the number of employee spaces per 1,000 square feet of office space, through the provisions of the City of Boston Zoning Code.

The Commission looks forward to working with your department and the Boston Redevelopment Authority to finalize the details of limiting the growth of employee spaces.

For the Commission,

Geoffrey M. Boehm
Sr. Administrative Assistant

cc: Robert Ryan, Director, BRA

Kevin H. White, Mayor/Boston Air Pollution Control Commission/ 182 Tremont Street 02111

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